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Choosing the Proper Machine for the Job

is no easy task. Expert advice is needed. The best advice obtainable is from machine tool engineers. J & L Engineers have a wide experience. They know their own product and that of their competitors. They recommend a machine only when it is

THE PROPER MACHINE FOR THE JOB

Jones and Lamson Machine Company
makes the following machines:

BAR TURRET LATHES	CHUCKING TURRET LATHES	FAY AUTOMATIC LATHES
2½ x 24	12″ - 15″	in three swings—12″—14″—24″
3½ x 32	18″	Each size in three different bed lengths and each with regular drive, center drive or double end drive.
	2 Spindle 9″	

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Springfield, Vermont

THE IRON AGE

New York, August 28, 1930

ESTABLISHED 1855 VOL. 126, No. 9

ANNOUNCEMENT

FOR the past ten months, The Iron Age has been engaged in one of the most thorough and extensive studies ever made by a business publication. This has been an intensive research directed solely to an appraisal of the needs of the readers of The Iron Age, in view of changes in the industrial situation and the problems that will result from them.

▪ ▪ ▪

The new and enlarged program of editorial service which has resulted from these months of study will be put into effect in The Iron Age commencing with the issue of September 4. It will speak for itself at that time, but a few words may be of interest now, concerning the problems confronting the industries served by this publication.

▪ ▪ ▪

Competition will be unusually keen, owing to the building up of large production capacities throughout industry and the erection of increased capital structures. These can be kept profitably employed only through greater volumes or the introduction of new economies.

▪ ▪ ▪

All of this means an accenting of the competition of industry against industry, and a part of it against another part, such as the past has not known. The new competition, as it still is called, makes more necessary than ever a journal of the character of The Iron Age. Industrialists demand the interpretation of economic and technical movements in competitive as well as their own lines, and in The Iron Age they get it.

With the rapid industrial developments that are taking place abroad, international competition has a new importance. Yet our export of manufactured products must continue to increase if American metal-working plants are to be kept busy.

▪ ▪ ▪

Though your market may be strictly a domestic one, you must meet the competition of those who are making a like product for world markets. Their cost reductions, made to preserve their foreign markets, are likely to set the pace and the price at home.

▪ ▪ ▪

In view of these facts, we may expect to experience, during the coming months, the most intensive hammering of production costs that the industry has yet seen.

▪ ▪ ▪

Our readers recognize the magnitude of the problems they face. To help them in the solution by giving them information, ideas, news and inspiration is the big task of the progressive business publication.

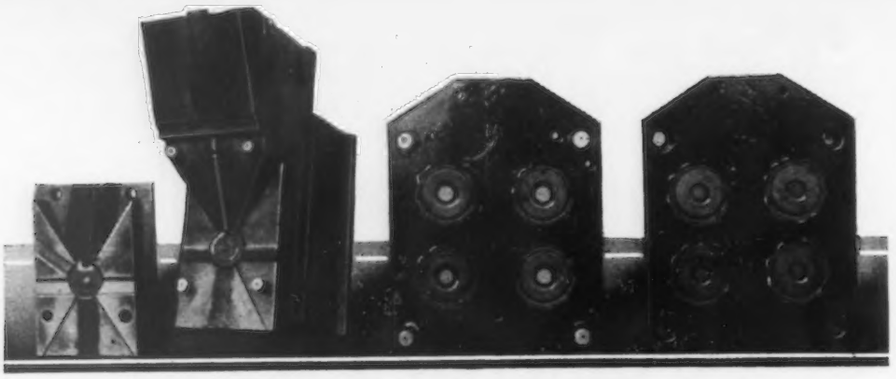
▪ ▪ ▪

This is the task to which The Iron Age has set itself and upon which it has brought to bear months of intensive research and the best thought and action of its entire organization. The result, we believe, will set a new standard in journalistic service.

Fritz J. Frank

President

THE IRON AGE PUBLISHING COMPANY



Correct Design and Heat Treatment of Steel Dies for Die Castings

By R. L. JOHNSON*

DIES for die castings, for the most part, are made up of three component parts: Top or cover half; ejector or bottom half (through which the ejector pins work to push the casting from the die), and the ejector box or mechanism which consists of the ejector movement.

Then there are the various cores and slides, from the small sizes, operated by hand, to the larger cores which must be pulled by power. Along with the cores must go their core guides, locks, etc., to complete the picture.

Their Requirements and Design

A PROPERLY designed die is necessary and can only be attained by experience, designing skill and the application of specialized knowledge. The user of the piece to be cast should supply the following information:

Use of piece in regard to its mechanical service.

Use of piece in regard to its contact with other metals, moisture, salt air, inorganic or organic acids, their salts or other corrosive conditions, and temperatures.

Quantity of pieces required during the year—whether this quantity is to be run off in one set-up or in short runs of possibly 1000 per month.

If the design of the piece is of a permanent nature and in all likelihood to outlive the die.

The really important dimensions and possible jigging locations along with such surfaces or faces that require the better finish.

What machining and other operations are to be done during the assembly.

How is the part to be finished.

Knowing the co-fundamentals, we can proceed along these lines: (1) Decide upon the proper alloy for the piece in question in relation to its mechanical duties and stability; (2) the alloy settled, the proper die steel must be chosen in relation to the alloy and the expected production; (3) the characteristic of the casting in question determines, on the smaller parts, the type of die to be laid out. They may be of the following types:

Single—one impression.

Multiple—two or more of same impression.

Combination—one of two or more different impressions.

Multiple combination—two or more of two or more different impressions.

The next procedure is one of die design. The die should be so laid out that the most important dimensions are along the parting line of the die. The ejector pins should be located, as far as possible, so as not to mar the appearance of the finished article. The necessary cores and slides must clear the machine so that they can be operated. Gating should be placed so as to feed the casting properly, giving the required finish with the help of the necessary vents. The drafts and shrinkage must also be figured out as well as the most economical type of die and machine.

Necessary cleaning, drilling, tapping and other machine operations and special jigs and tools required for the job must be settled.

Why Die Casting Steels Fail

DIE casting die steels fail, especially in connection with the higher melting point alloys, owing to surface checking or crazing. Checks are due to fatigue of the surface layer in contact with the molten metal. They are caused by the constant alternating expansion and contraction of this surface layer of steel to its fatigue point, aided by corrosion

*Metallurgist, Garwood Works of United States Aluminum Co., Garwood, N. J. This article is based on an address before a joint meeting of the Canton, Ohio, and Cleveland chapters of the American Society for Steel Treating.

and erosion, plus a mechanical wedging action of alloy fins in these checks.

Once a check starts, the next shot of metal into the die immediately fills this slight crevice with molten metal, which solidifies and remains in the newly formed check. Each and every shot thereafter keeps this fin of metal under constant impact and tends to deepen the already formed check.

A preliminary checking may start, due to the presence of inclusions in the steel, such as slag, manganese sulphides, etc. These compounds, being extremely brittle, break up and wash out. A check starts at this point and may be the combination of three causes: Corrosion (solubility), erosion, and the wedging action of metal fins. In most cases the check follows from one inclusion to another. Scriber scratches used by the diemaker for location of certain holes or dimension lines, slight tool marks, file marks and improper grinding are also starting points for early checking. Following this early cracking, the final checking is aggravated by the fatigue mentioned and is accelerated by extreme variations in die temperature gradients, due to cooling water running through the die.

SPECIALIZED knowledge necessary properly to design a die.

Die casting die steels fail frequently because of surface checking.

Life of a die is dependent more or less on the shape, design and function of the casting.

In 80 per cent of cases, the die outlives the demand for the piece it produces.

One-piece dies more satisfactory than built-up ones, but more expensive.

Modern trend is toward the more liberal use of alloy steel for aluminum dies.

Proper soaking period is highly important in the case of alloy steel dies.

Uniform Temperature Impossible and Undesirable

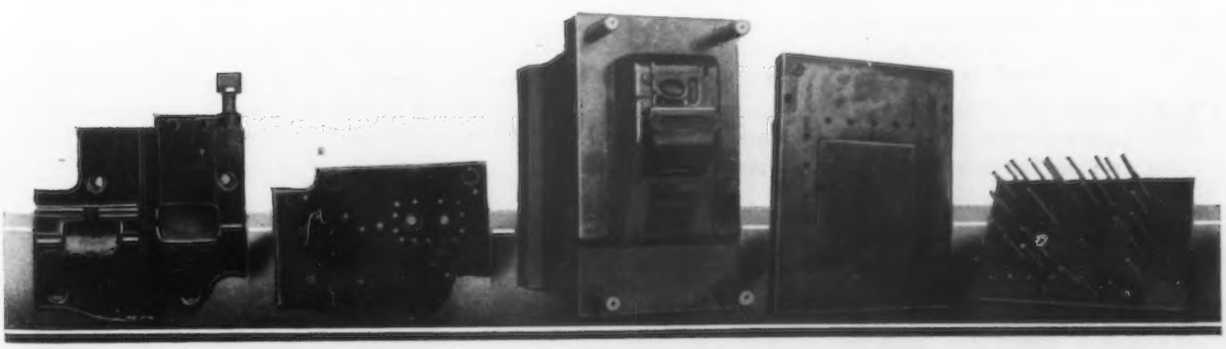
It is almost impossible and undesirable to keep a die at a uniform temperature throughout its whole mass. More water is needed in the vicinity of the gate where the greatest amount of heat is dissipated. The greater the mass of steel in proportion to the flow of water (provided the water is considerably below the impression surface) the less the danger of serious checking. This is due to a more equalized, uniformly heated die.

Another item of considerable interest is the fact that most of the impression surfaces are in the center portions of the steel forging or bar stock. Even with flat forgings hammered on all six sides, it is impossible to hammer-work the center of a steel block to any such degree of grain refining as the outer portion receives. A study of sulphur prints or deep etch tests on heavy bars or forgings illustrates this nicely. Then again, segregation in the original ingot is greatest in the center portion—such segregation will of course be found in the finished bar.

Similarity with Gun Linings

Noting the similarity between the checking of the rifling of large gun barrels and die-casting dies, the speaker, some 12 years ago, visited the Watertown arsenals and compared these check failures. The types of check were practically identical. The gun steel was a low nickel-chrome steel, while the die was of a chrome-vanadium type, the only apparent difference being that the gunners could ruin a gun faster than we could a die, this being of course due to the extremely high temperature, pressures and erosion at the time of ignition. The checking of the gun rifling was also extended by the copper bands of the shells pounding copper into the cracks formed, as in the case of aluminum dies. They have solved their problem more or less by the use of liners.

The actual life of a die is dependent more or less on the shape, design, and function of the casting. Long flat, unbroken die surfaces check rapidly and continue to craze. Complicated dies seem to give the best service. Waffle iron dies, with their numerous square nubbles, check at the corner of these projections. These small die cracks leave a slightly raised fin of metal in the casting. To clean these all out and leave the casting with a satisfactory finish



Representative combination, multiple and single dies of steels for die castings (above and at top of opposite page)

is impossible. The only remedy is to replace the die.

Castings that are free from sharp designs or engraving, sharp edges, etc., can be ground on an emery wheel to remove the checks on the casting at very little extra cost. This is dependent upon how far the user cares to go with this work. Dies can be polished and their life prolonged, provided dimensional limits are not exceeded. This polishing is only a temporary relief. Portions of a die can be replaced and hence carry the die along. Die life is from 15,000 to 200,000 castings, dependent upon conditions, and in 80 per cent of cases the die outlives the demand for the piece it produces.

Hardening the Dies a Difficult Problem

DIES in general are worked to finished dimensions when submitted to the hardening room for heat treating. This means that the cost of die-making labor is already on the die and that the user is waiting for samples. In other words, the hardening treatment is practically the final operation outside of some refitting, etc., after hardening.

This affords an extremely difficult heat-treating problem and is the crisis between making delivery of samples on schedule, or a delay of hours, days or weeks. Die casting, in most cases, is a jobbing business. Hence there is little chance for standardization of heat-treating practice since each die is designed individually for the casting in question. Therefore, there is no tried and fixed rule upon which the hardening room can be handled. Each die is a hardening problem in itself and must be treated as such.

One-Piece Dies More Satisfactory

Most manufacturers consider a one-piece die more satisfactory than a built-up one of several pieces of steel, in spite of the increased die cost. This is due to the fact that in the latter case there are more possibilities of dimensional changes due to loosening of holding bolts, screws, etc. The solid die, however, gives a wide range of steel thicknesses. This condition of heavy and thin sections of steel is an outstanding obstacle to the successful hardening of dies. Thus the two important points on hardening of dies are: Consideration of the charge mass in relation to the furnace size, and the advisable length of the soaking period at the proper temperature.

These days the railroads are experimenting with low-alloy steel rails, and the leading structural bridge engineers have been forced to the use of alloy steels to a greater extent, as a necessity in saving weight on long-span bridges.

Trend to Alloy Steel Dies

MODERN trend is toward more liberal use of higher alloy die steels for aluminum dies than those used in the past, which sell at much higher prices. These steels must, therefore, give sufficiently longer life and service to warrant this increased cost.

The higher alloy steels used for aluminum dies may be arranged in four groups as follows:

1. Chrome-vanadium type, with chromium and silicon the varying elements.

2. A chrome-tungsten steel, which has recently come to the front and seems to warrant its use in long-run jobs.

3. Tungsten steels with tungsten as the variable. The characteristic cold shortness of this type of steel is apt to cause trouble in dies cracking in service.

4. Experimental steels, etc., suggested by various steel mills. Analyses of the groups are shown in the table.

Dies for Zinc Base-Castings

DIES for zinc-base die castings, for the most part, are made today of a machine grade of steel, with added chrome—from 0.60 to 2 per cent chromium. These dies are used in the annealed state or hardened. If a considerable quantity of castings are to be made, the dies are hardened.

It is compulsory to know as much about the metallurgical and physical characteristics of each steel as it is possible to learn, in order to heat treat the more costly aluminum dies to the point where one can derive the utmost benefit. Unfortunately, complete data cannot be got as a rule from the various steel mills. This fact cannot be held as a criticism of the steel industry since steel makers are dealing more or less in generalities and have not the first-hand experience of those engaged in the die casting business. They cannot be expected to know each and every user's requirements or the solving of their problems, nor can they follow up results obtained. It is up to the individual die-caster to work out his own line of treatment, in many cases independent of mill recommendations. The importance of keeping accurate heat-treating records and service data cannot be overestimated.

So much is at stake as to the proper heat treatment of these alloy steels that it is a waste of money to use them unless their full properties are utilized. A cheaper steel, properly treated, would perhaps be better economy.

Importance of Proper Soaking Period

It is in this connection that the writer wishes to emphasize the importance of the proper soaking period. The carbides in carbon tool steels and in the low-alloy steels go into complete solution in a relatively short period and can be quenched almost immediately when they reach their proper heat. This is

(*Continued on page* 577)

Table of Experimental Alloy Die Steels

Steel	Type	C	Si	Mn	Cr	V	W	Co	
1	Cr.-Va.	0.40-0.50	0.20-1.00	0.50-0.70	2.5-3.0	0.0-0.20	.....	....	
2	Cr.-W	0.30-0.35	0.90-1.00	0.20-0.30	4.0-5.0	.....	3.5-4.0	0.5	With or Without
3	W	0.30-0.40	0.30-0.40	0.20-0.30	3.0-5.0	0.10-0.20	7.5-1.00	....	

Low and High Alloy Steel Castings Have Many Uses

By ALBERT RYS*

SILICON steels (about 1.5 per cent) afford high strength and resistance to wear as well as good impact values.

Chromium compositions (1.1 per cent) give high elastic limit and tensile strength —also more resistance to oxidation and chemical attack.

Nickel steels combine toughness with high elastic and ultimate strengths.

Chromium - nickel steels meet wide range of exacting requirements.

Molybdenum alloys (0.33 to 0.58 per cent) maintain high elastic limit at high temperatures.

IN the first section of this article[a] were presented certain general principles applying to the composition and heat treatment of medium alloy steels for castings. It is now proposed to discuss certain applications to specific casting problems.

Steels of Low Alloy Content

Silicon. — For high strength, both in tension and impact, and resistance to wear, as for bevel or cogwheels, silicon steels may be used. With 0.40 per cent C, 1.50 per cent Si, 0.50 per cent Mn, and with proper heat treatment, an elastic limit of 48 kg. per sq. mm. (66,000 lb. per sq. in.) is attainable, with an elongation in five diameters of 18 per cent. With lower carbon contents, silicon steels are suitable for structural purposes. They should be cast in well-dried molds and with ample sink heads.

Chromium. Where brittleness may be less disadvantageous, the 1.1 per cent Cr steels give a high elastic limit and tensile strength (60.5 and 83.4 kg. per sq. mm. respectively). They are also more resistant to oxidation and chemical attack than are ordinary steels.

Both green and dried sand molds may be used, and the steel should be cast at a fairly high temperature. It requires careful heat treatment, and also should not be cut with a torch.

Nickel. These steels combine toughness with high elastic and ultimate strengths, as well as resistance to corrosion and chemical attack. There is a tendency of the material to develop hardening cracks, the more so the higher the nickel content. The grade most used contains one per cent each of nickel and manganese and 0.25 per cent of carbon, has a yield point of over 33 kg. per sq. mm. and an impact value of 8 mkg. per sq. cm. It finds use in gun carriages and in electrical machinery. In large sections it has the advantage that heat treatment affects the casting almost uniformly.

For marine propellors an alloy containing 0.45 per cent Mn, 2.75 per cent Ni, and 0.23 per cent C is especially useful due to its ability to withstand saline attack.

Chromium Nickel and Molybdenum Compositions

Chromium-Nickel.— These steels may be used to fulfill a wide range of rather exacting requirements. Due to its slow critical cooling rate, large castings may be made with assurance of uniform properties throughout. For best results, the use of pure materials, careful melting, and careful heat treatment is recommended. For large castings, it is considered good practice to precede the heat treatment by a normal heating to refine the grain. Typical uses of these steels are for heavy duty screw conveyors, mandrels for seamless tube mills. Typical analyses show 0.25 per cent C, 1.60 per cent Cr, and from 1.00 to 4.00 per cent Ni.

Molybdenum.—Alloy steels containing molybdenum are distinguished chiefly by their ability to maintain a high elastic limit at high temperatures, as the table below illustrates:

Composition			Temp., Deg. C.	Elas. Lim. Kg. per Sq. Mm.	Tens. Str. Kg. per Sq. Mm.	Elong., Per Cent
C	Mn	Mo				
0.19	0.60	0.33	20	30	49	25.5
			500	15	40	30.0
0.37	0.75	0.58	20	31	65	18.0
			500	26.7	50	29.6

This material is well-adapted, for example, for making turbine housings.

Steels of high alloy content have chromium, nickel, and manganese with smaller amounts of tungsten, molybdenum, vanadium and cobalt, and may be

(*Concluded on page* 598)

*Essen, Germany. The article is abstracted from the foundry issue of *Stahl und Eisen*, No. 50, 1930.

[a] See THE IRON AGE, June 19.

The Customer is Served

By F. F. ROHRER

AMERICAN industry has made considerable progress in reconstruction programs started a few years ago. Improved efficiency, cost reduction and the development of labor-saving devices have been accomplished by this program of modernizing manufacturing facilities. Much has been achieved by engineering studies in improving the design of manufactured product and making effective use of modern manufacturing facilities. Many new applications for the use of the product of industry have been developed. Sales promotion and sales distribution plans have been worked out to a high degree. The public at large has heard considerable about these accomplishments.

Very little has been said about an element essential to the success of industry, commonly referred to as "serving the purchasing public," but really "industrial business administration." With good designs, good material, well manufactured product and effective sales and distribution plans, industry would be greatly handicapped unless a good plan of administrative procedure was also developed.

Service to Customers Essential

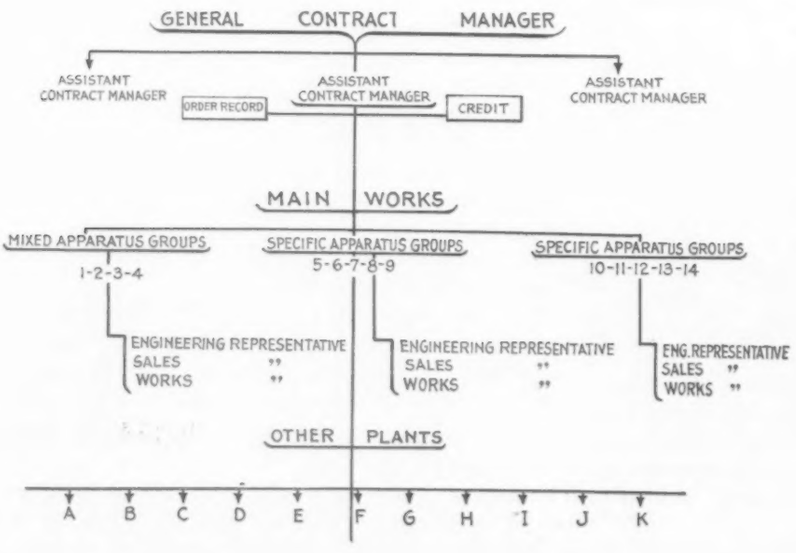
Coordination of the elements in industry, contributing to service to customers, is positively essential to any plan of administration if a company is to gain a reputation for integrity with its customers. A customer is not particularly interested in the success of any one branch of activity. He looks for an overall company response consistent not only with the representations made for the product, but the fulfillment of contractual obligations, with particular emphasis on shipment.

In addition to those elements, there are other important activities; such as credit, accounting and treasury department contributions involved in this overall company response. Experience has proved that all of these elements must be synchronized, so that the ultimate accomplishment is a satisfied customer.

Coordination Quickens Company Response

Such a plan of business administration has been developed by the Westinghouse Electric & Mfg. Co. Briefly, the fundamental idea is to promote such a recognition that no matter what department or group of departments may be involved in an undertaking, it is the company response that is important, and the only response to be considered in this business administration plan.

Under the leadership of a group of supervisors, the facilities of all departments are coordinated to give this response. The graphic chart presented here-



CONDENSED organization chart of the Interdepartmental Contract Administration Plan of the Westinghouse Electric & Mfg. Co. shows the coordinating factors in this plan for the efficient manufacture and speedy delivery of the company's product to its customers. It can readily be adapted to the functions of smaller companies engaged in the manufacture of almost any product or line of products where coordination is necessary.

F. F. ROHRER, general contract manager of the Westinghouse Electric & Mfg. Co., has responsibility for service to customers under contracts and has general supervision of all business administrations of the company under a new plan inaugurated in 1928. He was born at Harrisburg, Pa., on April 22, 1876, and entered the Westinghouse company's employ as a student in 1896. After serving in the shops for four years he was transferred to the sales department. During the war, Mr. Rohrer was a member of the committee of the War Industries Board appointed to conserve the production of turbine-generating equipment for Government needs. After the armistice, he became the representative of the Westinghouse company in the settlement of contracts terminated as a result of the ending of the war. Later, he served as assistant to the managers of both the power and railroad departments, being promoted to general contract manager in 1922. In his capacity as general contract manager, Mr. Rohrer reports directly to the president of the company.

F. F. Rohrer

with indicates the segregation of responsibility for specific lines of product and undertakings. Representatives from the credit, sales, engineering and works departments are grouped together, each representative being responsible for his departmental interest and the action necessary to the successful accomplishment. Each departmental representative, while supervised by the group supervisor for procedure, is responsible to the head of the individual department he represents for the successful departmental contribution. These representatives have back of them the full resources of their departmental organization to use as may be required. By this arrangement and the tie-in through the supervisory staff, difficulties which arise are quickly overcome without seriously affecting the company's obligations to its customers.

Experience has demonstrated that this plan has four distinctive advantages:

1. It has considerably reduced the time for the so-called procedure.
2. It hastens decisions so that the physical operations may be continuously and uninterruptedly carried on.
3. It affords more dependable forecasts for shipments.
4. It has contributed much toward shortening the period from the time the business is awarded to the time when the apparatus is manufactured and shipped.

After all, a manufacturer is judged by the overall results in making good his obligations. One department contributing to an undertaking may have unforeseen difficulties. With the plan of coordination set up and the opportunity afforded for assistance by other departments, and with all interested in the final outcome, means are promptly developed for overcoming the difficulties without serious disturbance to the manufacturing program, and without inconvenience to the customer.

Copper Steels Improved by Heat Treatment

AT the May meeting of the Verein deutscher Eisenhüttenleute, held in Düsseldorf, Germany, two papers were presented dealing with the properties of copper-bearing steels, and the particular conditions of heat treatment necessary to bring out their qualities. These papers appeared in *Stahl und Eisen* for May 15, the first, by Franz Nehl, dealing with corrosion resistance, strength, and heat resistance, and the second, by Herbert Bucholtz and Werner Köster, taking up the hardening of the steel.

Nehl points out that ordinary copper steels show an improvement in tensile properties, both at low and at high temperatures, over unalloyed steels. The ultimate strength of mild steel is raised about equally by 0.12 per cent of carbon and by 1.0 per cent of copper. The following data are illustrative of the behavior of the copper alloy at high temperatures:

	Tensile Strength, Lb. per Sq. In.		Elastic Limit, Lb. per Sq. In.	
	20 Deg. C.	500 Deg. C.	20 Deg. C.	500 Deg. C.
Carbon steel (0.29% C, 0.14% Cu)	66,500	33,300	29,400	13,400
Copper steel (0.11% C, 0.85% Cu)	66,400	41,400	46,800	25,300

In order to further improve the properties, the following heat treatment was used in testing some sheets: 6 hr. at 650 deg. C., normalized (1 hr. at 900 deg. C.), cooled to room temperature, and heated 6 hr. at 650 deg. C.

During the heating at 650 deg., the excess of copper precipitates from solid solution. The effect of the treatment is an improvement in tensile strength, elastic limit, and in the ratio of elastic limit to tensile strength. There is also a hardening effect. Best results were obtained by annealing between 500 and 550 deg. C.

The reason for this improvement in physical properties is said to be the separation of copper from the iron-copper solid solution when the material is cooled from 500 deg. C. This is similar to the well-known duralumin reaction. Thus the amount by which the tensile strength is raised by heat treatment will depend somewhat upon how slowly the final cooling takes place. Experiment shows that if more than 6 hr. are required to reach room temperature, somewhat lower than the maximum strength will be developed.

It was also found that on annealing at about 390 deg. C., no change in properties takes place, a valuable attribute, for it indicates that a heat-treated copper steel may be used up to about 400 deg. C. without fear of deterioration.

Tooling Systematically Studied at Gear Plant

BY J. W. MARSHALL

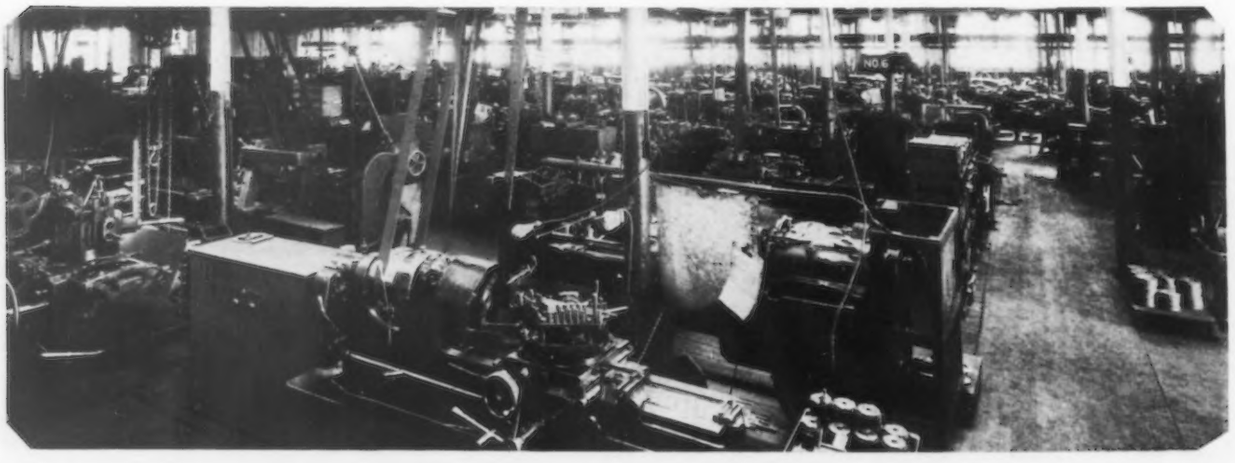
THE efficiency of tool equipment is vital to successful manufacture. In industry as a whole the influence exerted by the design and maintenance of tools is so extensive that good tooling may be said, perhaps, to be the backbone of this, the so-called machine age.

For cutting tools, carbon steel was followed by high-speed steel and faster and more rugged machines to use it; now high-speed steel is yielding for some work to tungsten carbide with the prospect of the necessity of still more rugged and faster machine equipment.

Production losses through inadequate tooling are not only more closely watched, but, and this is the positive side of the picture, the possibilities of the best tools and tooling are more actively studied and exploited than ever before. An example of organization and preplanning to this latter end is to be found at the Boston Gear Works, which the writer visited recently.

At this plant, tools for the various jobs are specified by the planning department, which is made up of men from the shop who are both machinists and draftsmen. These men tackle each job on the theory that out of many ways to tool a job there is one best way and that by finding that way the cost of producing the job is kept at a minimum.

The tools to use, their design and maintenance are centered in a tool committee consisting of the manager of the planning department, the chief engineer, the tool supervisor, the turning supervisor, and the cutting supervisor. The tool supervisor is in charge of the design and construction of the tools; the turning supervisor of their use in the turning shops; the cutting supervisor of their use in the gear cutting shop; the chief engineer of the engineering aspects of the undertaking; the planning-department manager of the routing of the work and the specification of all the tools required for each operation of each job. The purchasing agent also meets with this committee when



Tools used in making a special worm gear are shown at top of page. These include a cut-off and forming tool, a reamer, a go and no-go plug gage, a go and no-go snap gage, a mandrel, a hob and a special testing fixture, the latter being shown in the center. Special tooling assures smooth and economical production in the turning shop, part of which is shown above.

the interests of his department are involved. When a job originates, these five men confer and agree as to the best method to do the work and all related problems.

The tools used may be broadly classified as purchased and special cutting tools and as jigs and fixtures. They may also be classified as those used for the making of standard gears and parts and those used for the making of special parts. Purchased tools, such as drills, taps, reamers and milling cutters, are under the direct supervision of the tool-crib supervisor, who reports to the tool supervisor.

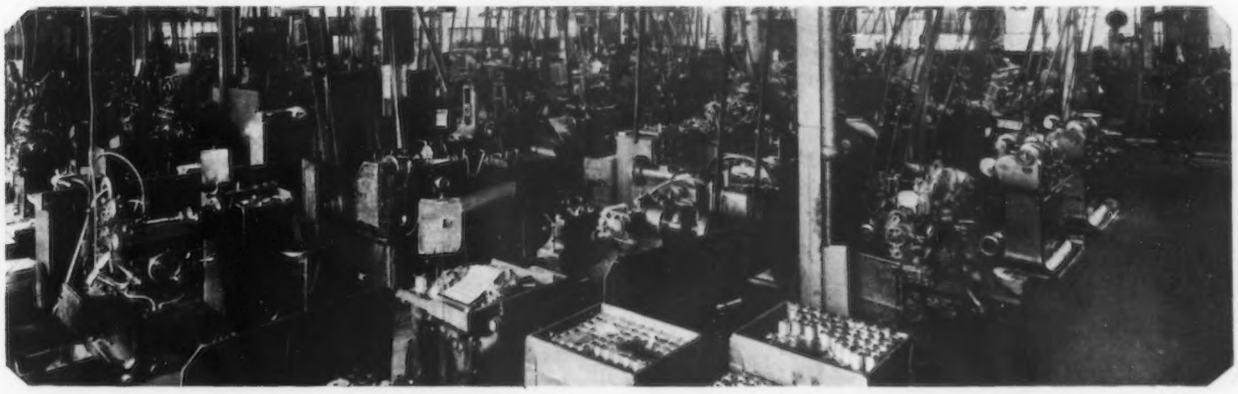
Tool Materials Standardized

The special tools for standard parts are the result of much study and experiment upon the part of the tool supervisor. As a consequence of tests made in the experimental department, under the chief engineer's direction, the materials entering into the tools are standardized and classified, different standards being arrived at according to the nature of the tool, as whether it is a cutting tool, a gage, or a jig or fixture. Experiments constantly in progress in this department are intended to assure that no means for improvement are overlooked.

Jigs and fixtures are designed by the tool designer under the direction of the tool supervisor. The machines on which the work is to be done and the order of precedence are so determined by the planning department, in cooperation with the tool, turning and cutting departments, that the delivery promise will be satisfied. Drawings of the special cutting tools are made by the tool designer in accordance with the blueprints of the work to be tooled, the latter coming to him from the engineering department through the planning department. The tool designer and the toolroom foreman work together in the production of these drawings, which when completed go to the toolroom foreman, who produces the tools.

The completed tools go to the various tool-storage departments, as the turning, cutting, or grinding tool-storage department, in accordance with the nature of the tool. Here the tools are assigned numbers by the tool-crib supervisor, who records the number assigned and notifies the tool-design and planning departments accordingly. This procedure furnishes the planning department the means for specifying the tools to be used by the workmen and furnishes the tool designer with information needed by him to prevent the redesign of the identical tools on future occasions. When replacements are needed, the men in charge of the tool cribs notify the supervisor of tool storage, who in turn notifies the tool supervisor. In this way the tool supervisor is kept informed at all times of the status of the tools.

When the planning department routes a job to a machine, it has the drawing for the job and an instruction card delivered to the tool assigner, located in the tool-storage department. This man is charged with the responsibility of having tools replaced, if required, and of keeping in contact with the tool designer so that he can advise the planning department as to when tools will be ready for new jobs. He also notifies the tool designer what tools he has assigned to specific jobs to assure that the same set of tools will not be assigned to another job. The tools are loaned to the workmen on the checking system, the tool numbers being designated on the workmen's route sheets. When the tools are returned to the storeroom they are inspected and, if not suitable for a new job, replacements are ordered immediately.



The cutting department of the Boston Gear Works is called upon to cut a large number of sizes and types of gears. Special tooling is used extensively throughout the shop.

Procedure On Special Jobs

When a special job is received, the planning department communicates with the supervisors to determine the most suitable routing. When routed, the drawing is sent to the tool designer who gives an estimate of the time required to make the tools to the planning department. The later deparment then estimates the time required to do the job and passes this information to the engineering department which notifies the customer as to the delivery date. The planning department then determines whether there are operations on this job that can be done with special tools previously made. This is done by a comparison with standard route sheets. The numbers of these tools are obtained from the route sheets. This information is then sent to the tool assigner in the tool crib who determines whether the tools are suitable for the job. If so, he notifies the planning department that the tools have been assigned to the job. He also notifies the tool designer what additional tools will be needed. The planning department then receives a notice as to when the tools will be ready; later it receives notice that the tools are ready. The first notice serves as a guide in planning future work, the second that procedure in the shop can begin.

Ratio of Metal Charged to Cupola Melting Speed Is Important

By W. N. TRUXELL*

DEMAND for castings in large quantities and of a high and uniform quality has brought into existence the present-day production foundry, specializing in a particular line of work. These foundries have devleoped methods and machines for their own production which are highly efficient. In the melting department, the cupola has undergone but slight changes in design, the higher charging door and increased tuyere area being the notable differences. These improvements have increased the melting efficiency considerably. Foundry cupolas today are approximately the same, regardless of the type of castings produced. The various grades and qualities in iron result from the different metal charge and charging methods used.

One Variant Established

A careful check of the charging procedure followed in a large number of foundries shows that the one established variant is the weight of the metal charged in proportion to the melting speed of the cupola. In the case of foundries making extremely light castings, such as light hardware, toys and novelties, a charge weight of approximately 8 per cent of the cupola's melting speed per hour is used. This percentage increases with the thickness of section in the work to be cast. Cooking utensils, sanitaryware, radiators, etc., are cast with a charge weight of 10 per cent of the melting speed. As another example, several large foundries making automobile cylinder blocks, in which work a sectional thickness of 3/8 in. is approximate, find their best results are obtained with a charge weight of 11 per cent. Foundries making carwheels and ingot molds use the heaviest charge weights. These are, of course, of heavy section and in this group the charge equals 20 per cent and more of the melting speed.

Higher Charge Weights Required

Jobbing foundries making a variety of work and running their cupolas with light charge weights find that the heavier sections of their castings have a tendency to show spongy. Upon increasing the weight of the charges these spongy spots disappear. This increase of charge weight is practical only up to a certain point, since it is also necessary to melt iron hot for the lighter type of castings, and it becomes increasingly difficult to do so as the charge weight increases. The average jobbing foundry uses a charge weight of approximately 11 per cent and then depends upon risers to give solidity to the heavy section. It can reasonably be assumed here that unless the foundry has some exceptionally light work to run, a charge weight of 15 per cent will give much better results.

Experience has definitely proved that increasing the metal charge decreases the loss from spongy sections, and in no way injures the smaller castings. The data show that light charge weights tend to produce iron having a high occluded gas content. In thin sections, the metal is able to free itself, but in the heavier castings trouble is experienced.

Proper Control of Carbon

Foundrymen are melting an increased tonnage of steel scrap in their cupolas each year. In most cases a percentage of steel is beneficial to the metal. The only elements in the steel analysis which are of interest to the foundryman are the carbon and phosphorus content. The carbon in cupola scrap is normally 0.20 to 0.75 per cent, with the phosphorus negligible. It is generally accepted that 3 per cent total carbon is what can be expected at the spout. At once it is seen that 2.25 to 2.75 per cent of carbon is picked up by the steel in the cupola. This carbon is taken from the coke and must be reckoned with in charging.

For purposes of illustration, if the cupola is melting iron on a 10 to 1 ratio between charges, when the steel is charged, the coke must be stepped up proportionately if the same ratio is to be maintained. For example, in a 2000 lb. charge of metal, 50 per cent iron and 50 per cent steel scrap, whose carbon content is about 0.2

*Foundry engineer, Potter Coal & Coke Co., Greensburg, Pa. From an address before the Pittsburgh Foundrymen's Association, on May 19.

per cent it will be seen that 1000 lb. of 0.2 per cent carbon steel will require 28 lb. of carbon to raise it to 3 per cent total. Coke running 90 per cent carbon means that approximately 31 lb. of fuel will be utilized solely in building up this carbon content and, therefore, 231 lb. of coke would be required.

There is no reason to expect the cupola to operate on a higher efficiency figure on steel than on iron and the higher melting point of steel will necessitate more fuel. Gray iron melts at 2260 deg. Fahr. and steel at approximately 2600 deg. Fahr., an increase of 340 deg. or one-seventh of the gray iron temperature. Since the cupola in this illustration is on a 10 to 1 basis, it follows that one-seventh of 100 lb. or 14½ lb. of coke should be added, making 245 lb. of coke and this resulting in a melting ratio of approximately 8 to 1. By following this method, the weight of coke required to melt any percentage of steel is easily determined. Many cupola operators do not attain a 10 to 1 ratio between charges and the individual ratio must be used in making the computation.

WEIGHT of the metal charged in proportion to the melting speed is the established variable in foundry practice.

¶ Greater quantities of steel scrap are being melted each year.

¶ Average jobbing foundry uses a charge weight of approximately 11 per cent.

¶ Increasing the metal charge decreases the loss from spongy sections.

¶ Cupola will not operate on a higher efficiency figure on steel than on iron.

¶ Melting point of steel scrap decreases as the carbon content increases—hence popularity of steel rail scrap.

Rail Scrap Not Essential

The melting point of steel scrap decreases as the carbon content increases, this accounting in a measure for the popularity of rail lengths as melting scrap. The comparatively high and uniform carbon content in conjunction with size and handling ease makes this variety of scrap ideal for the jobbing foundry, where usually only a portion of the heat is of a steel mix and must be kept separate from the gray iron. However, nearly any form of steel scrap can be melted in the cupola and some kinds can be purchased a great deal cheaper.

Making High-Strength Iron

Steel is used to make the gray iron stronger and tougher, and usually in this connection various alloys are also employed. A great deal is being done along the line of making high-strength iron in the foundry and in this connection the following procedure is used in several large foundries:

A double charge of coke is placed on the last iron of the gray iron heat and run through to the end, draining the cupola. The blast is then shut down and preparations made to recharge, first building up the bed to the usual height and then charging 100 per cent steel scrap with ferromanganese. Charges should be light, about 8 per cent of the melting speed, and limestone used to about one-third the coke weight.

When four to five charges have been placed in the cupola, the blast is again started and the steel heat run. Ferrochromium is usually added at the spout, along with nickel and the ground ferrosilicon. Adding silicon at this point produces additional heat in the metal and consequently larger amounts of alloy can be used.

Metal produced in this manner compares favorably with the best high-tensile cast iron on the market and, principally because of the hot condition of the cupola, no trouble is experienced in melting. The alloying in the ladle is subject to the kind of metal desired, but will produce more uniform results and at less cost than by charging the alloy in the cupola.

New Types of Slags for Ferromanganese

IN the manufacture of ferroalloys the slag composition is usually controlled by the impurities in the ores available and the addition of raw materials to give a satisfactory slag. In almost all technical operations the operator attempts to stay within certain limits of slag composition because experience has indicated that this particular range of composition gives the best operating results.

The development of the high-frequency induction furnace has made it possible to study, with comparative ease, new types of slags. For example, the metallurgical section of the Pittsburgh Experiment Station of the United States Bureau of Mines has investigated charges capable of producing ferromanganese where the slag composition is varied far from the limits of commercial operation. Some of the results have indicated that much better operation may be obtained by using an entirely different type of slag from that which is ordinarily used in the manufacture of ferromanganese.

It is to be hoped that some time in the future the operator will have data available which are not only trustworthy but which also will allow him to use quite different types of slags from those used in present-day operation without having to do experimental work on the tremendous scale necessary if a commercial furnace is used. Slag weights and slag compositions are very often the controlling factors in the production of quality material at low cost, and the efforts of the metallurgical laboratories should certainly be directed in some part to the development of types of slags other than those which are used at the present time simply because experience in practical operation has designated certain fields in which to work.

Chinese Packing Industry Needs Modern Can-Making Machinery

By WALTER BUCHLER

DESPITE continued political disturbances in China, domestic industries are steadily progressing, aided by the Government, chambers of commerce and other organizations urging the public to promote the use of home products by giving them preference, or at least a trial. The canning industry in China is one of the most rapidly growing branches of production and is increasing in importance as a larger variety of foods is conserved by the Chinese, who find tinned products easier to keep and less expensive as a rule than the fresh.

Although the canning industry is developing, there is a great need for better packing methods and the substitution of modern, high-speed canning machinery for crude methods, antiquated equipment and hand labor. There is also a necessity for improving the quality of the finished product, which depends largely on better packing rather than on a higher quality of raw product, as the fruits, vegetables, fish and meat available in China are good and the supply is large.

Canning Would Relieve Famines

In recent years great numbers of Chinese have perished of famine, and yet in certain sections of China there has been a surplus of vegetables, fruit and other foods, which, had they been canned, could have been quickly despatched to the famine areas.

American canned products imported into China are superior in quality to the domestic supply, but the great majority of the 500,000,000 population can afford only the cheapest of such imports. Faced with this situation, the Chinese packing industry is seeking in every way possible to produce home canned foods, to sell at prices within reach of the mass of the people.

There are about 50 canneries of importance in China and, in addition, a number of smaller companies preserving fruits, vegetables, meats, and game, as well as manufacturers of biscuits and confectionery. All these plants are using tin plate containers for their products and in most cases need to replace obsolete can-making machinery with modern high production equipment. American sellers seeking to develop this market will find that it is not necessary to extend financial aid, for there is always Chinese capital available for modern industries, especially for manufacture of necessities such as food products.

Egg Products Packed in Tin Plate

China is an important producer, consumer and exporter of egg products, the containers for which are of tin plate. With the development of better transportation facilities in the country, agricultural districts far removed from centers of consumption will be opened and there is certain to be a great increase in the preparation of these egg products.

A number of important plants are packing egg

products, the largest owned and controlled by foreign capital, and the need for modern packing machinery is increasing yearly.

Cigarettes Packed in Tins

Another growing market for tin plate and can-making machinery is the rapidly growing tobacco industry of China, concentrated largely in Shanghai, where foreign and Chinese companies are using modern equipment to pack loose tobacco and cigarettes in tin containers.

China's importation of oil is so great that a large quantity is brought in bulk and transferred to 4-gal. containers of tin plate for distribution. These containers are made locally, and with more motor cars in use and aviation developing, the demand for these 4-gal. containers of gasoline and kerosene should increase greatly.

To further the sale of American can-making machinery and tin plate in China, close contact with prospective buyers among the Chinese is essential. Manufacturers will find the Chinese market worth cultivation and should either be represented by foreign companies established in Shanghai, Tientsin, Hankow, or Hongkong, or establish a branch office in Shanghai, from which agents in other cities could be appointed.

CHINA'S food packing industry must offer canned goods at lower prices than the imported if it is to develop the vast potential market of 500,000,000 population. Lower costs are based on modern, high-speed, can-making machinery, capital for the purchase of which is available in China, offering a desirable and profitable market to the American seller.

The author has been engaged in trade and manufacturing in the Far East for the past 10 years and is familiar with many of the problems arising from China's industrial growth.

Approximately 600 Electric Furnaces in the United States

THE phenomenal increase in the use of the electric furnace for the manufacture of steel in this country and the resultant revolution that has taken place in the methods of steel making by electricity in the course of two decades are likely to be emphasized in staging the iron and steel display at the Chicago World's Fair in 1933, according to the report of the iron and steel section of the National Research Council Science Advisory Committee.

In the report outlining a provisional plan for the iron and steel display it is pointed out that "the American electric steel industry had its start just prior to 1909." The first year of commercial production of electric steel in this country, the report states, was 1908, when 55 tons of electric steel was produced at Syracuse, N. Y., in the first Heroult furnace to be installed in the United States.

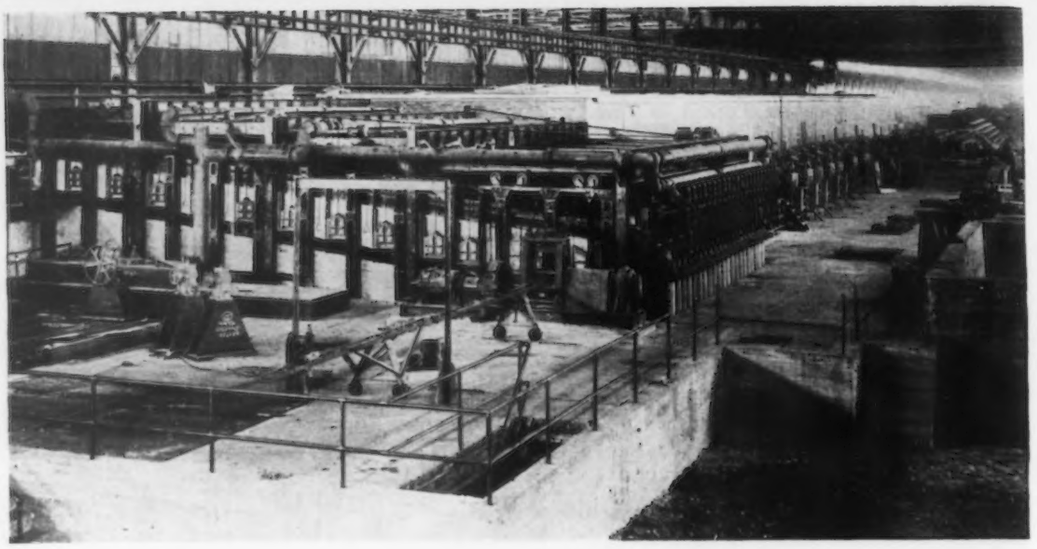
In 1909 there were only 10 electric furnaces in this country, according to the report, when Germany had 31, France 22, Italy 12 and Austria 10. Electric furnaces in existence in that year throughout the entire world numbered 114. At the beginning of 1913 there were 19 electric furnaces in this country. In 1914 "electric steel passed the experimental stage and became a practical modern method of making high grade steel, replacing the crucible method rapidly." On Jan. 1, 1915, there were 41 electric furnaces in the United States, and in 1917, the number was 136, rising to 233 on Jan. 1, 1918.

In five years the annual steel output of the United States had doubled, the report states, while the tonnage of electric furnace steel had increased 20 times. The report adds that "in tonnage the electric furnace reached the crucible production by a wide margin with crucible production standing still since the appearance of the electric furnace."

On Jan. 1, 1919, there were 287 electric furnaces in this country, the then two largest anywhere in the world having been installed later in that year at the ordnance plant at Charleston, W. Va. On Jan. 1, 1925, there were 470 electric furnaces throughout the country. The largest electric furnace in existence was installed at the Timken Steel & Tube Co. at Canton, Ohio, in November, 1928. At present, the report states, there are approximately 600 electric furnaces in the United States.

"While approximately 98 per cent of the American production," the report notes, "has now been changed over, it is estimated that not more than 70 per cent of the European production has been changed. This is interesting because the electric furnace was developed in Europe and had gained quite a foothold there before it was adopted in America."

A specification recently issued by the (British) Engineering Standards Association, and designated as No. 215-1930, covers hard-drawn aluminum and steel-cored aluminum conductors for overhead power transmission purposes. According to *Commercial Standards* for July, published by the Bureau of Standards, the specification differs from its predecessor of 1925 mainly in that the value of the resistivity has been slightly altered to conform to the value recently adopted by the International Electrotechnical Commission. The tables given in the specification have been re-calculated in accordance with the new value of the resistivity. Provision has also been made for certain of the mechanical tests to be carried out both before and after stranding. Slight modifications have also been made in the galvanizing test.



Billets 1¾ to 3 in. square are pushed through the furnace by an electrical pusher. The furnace uses coke-oven gas with air pre-heated in a mantle recuperator. Beyond are the 15 stands of the rolling mill with the hot bed in the distance.

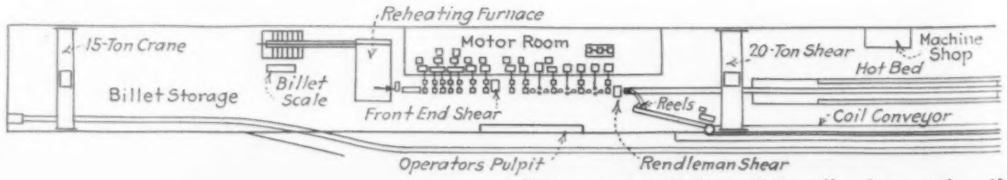
Produces Bars or Bands

THE Inland Steel Co.'s new merchant bar mill, which has been under construction for more than a year at the Indiana Harbor Works, is now completed and ready for operation. This is Inland's third bar mill at this plant.

Finishing on 10-in. rolls, this mill is equipped to produce the smaller sizes of rounds, flats, squares and shapes, as well as bands down to No. 12 gage and coiled material.

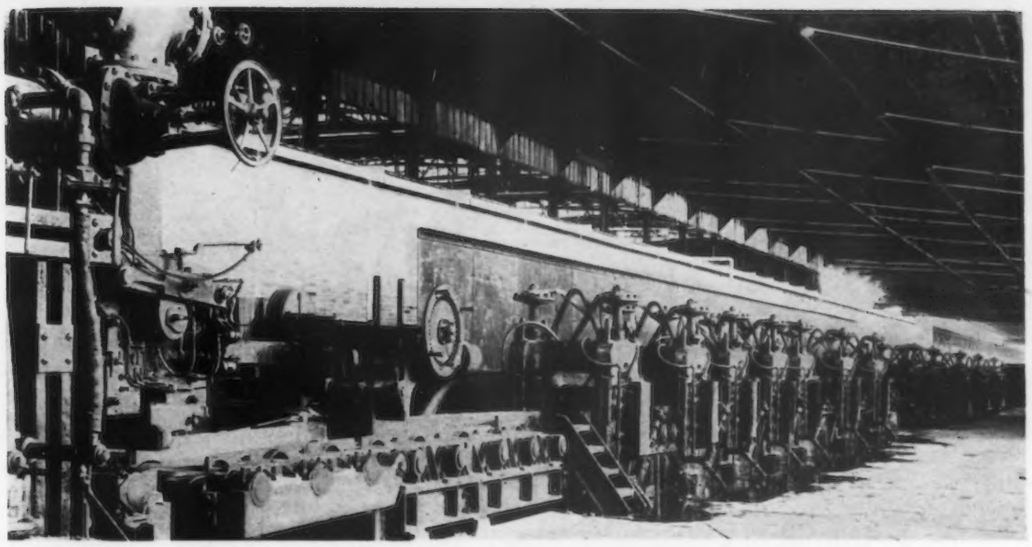
The new mill is housed in a modern structure 2000 ft. long by 100 ft. wide. Particular attention has been paid to adequate lighting. From the existing continuous billet-mill, billets ranging in size from 1¾ to 3 in. square are carried to one end of the mill by special cars which have stakes at the side and the center, for convenience in handling the billet-lifts. Each 15-ton lift is carried in a chain sling and the billets are handled out of the car into the billet-storage by a 15-ton crane. The chain is allowed to remain about the lift so that the latter is ready to be picked up again without delay or unnecessary expense. Next in line with the billet-storage is the billet-scale, where the 30-ft. billets are made ready for the continuous reheating furnace.

The furnace is of the side-charge and side-discharge type, has a slope of 1½ in. per foot, and a roof



First seven stands have 14-in. rolls, the next five, 12-12, and 14 are vertical mills designed

The double escapement type hot bed includes provision for the continuous stocking of flats for annealing. At the right along the columns is the conveyor for coiled material.



The first seven stands of 14 in.-rolls, beyond which is a flying shear for croping front ends of billets.

ls at 2000 Ft. a Minute

of the flat, suspended type. The distance from the center of the inlet door to the center of the discharge door is 45 ft. Coke-oven gas is used for fuel, and the air is preheated in a Mantle recuperator. The billets are charged by an electric mule and a driven table, the mule operating on the table's side-guards. The billets are pushed through the furnace by an electric pusher.

Just beyond the reheating furnace is the mill proper. It has 15 stands in line. The first seven stands have 14-in. rolls, the next five have 12-in. rolls, the last three 10-in. rolls. Stands Nos. 2 and 3 are driven by one motor, as are stands Nos. 4 and 5. The remaining 11 stands have each an individual motor-drive. These motors have a two-to-one speed-range with full voltage; two generators provide them with an additional speed-range below the full-voltage low speed.

Stands Nos. 10, 12 and 14 are vertical mills designed to act as full working stands. They are so arranged that the vertical rolls may be raised or lowered to keep the bar in a straight line regardless of which pass in verticals is being used.

There are looping-tables before and after each vertical stand. These permit a side or down-loop accord-

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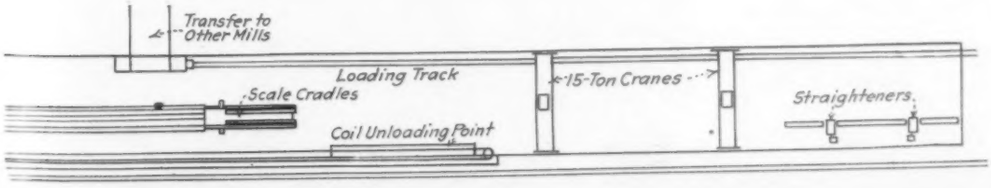

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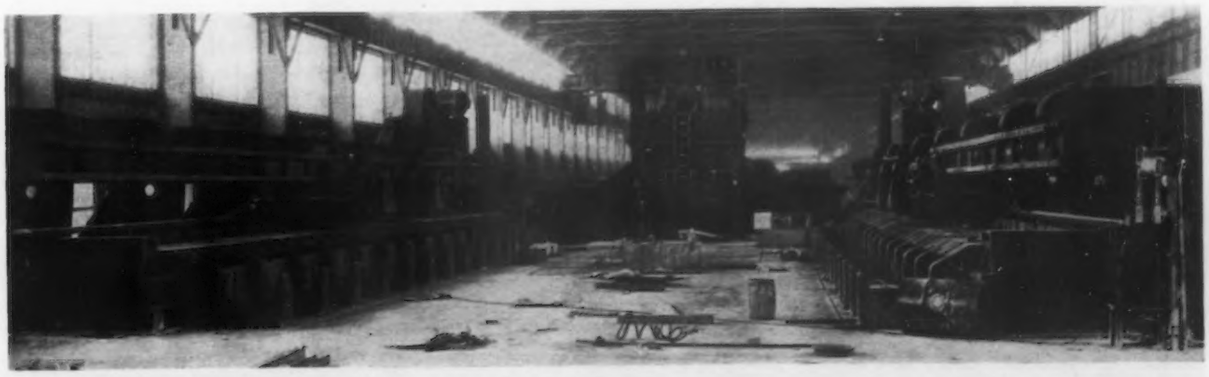
in. rolls and the last three, 10-in. rolls. Stands Nos. 10, to act as full working stands.



The two hot bed run-out tables deliver the finished material to the shears, where comprehensive gaging equipment provides for accurate cutting to lengths.

Giving Technical Training

NATURALLY the several executives of the numerous organizations are vitally interested in the General Motors training program, but none more so than C. F. Kettering of the General Motors Research Division. He has given considerable thought to educational problems and has defended cooperative education from the start, consistently urging its adoption.

"In contrast to the colonial days," said Mr. Kettering, "at present the social situation has completely changed: no industrial work is done at home. The whole workaday world is outside the home; and the home has become the place of culture, with music, books, art and things of that sort.

"But in spite of this drastic change of social circumstances, there still persists among educators the old desire to confine their efforts to the cultural aspect of education. Their overemphasis on cultural things, in turn, entirely overlooks the average person in the business world. Fortunately, many educators every year are introducing new practices and principles to adapt the educational system to include and train this average person.

"Cooperative education is not necessarily going to supplant the strictly cultural system, although results where it is in effect are wonderful, as at the University of Cincinnati and at Antioch. This latter school has, in fact, developed the idea of training for proprietorship.

Butt-Welding a Man Upon Industry

"In such a training the assumption is made that a man who is going to run a garage after graduation will be a better proprietor in his business if he learns something of

*This is the third and concluding installment of a broad discussion of the General Motors Institute of Technology at Flint, Mich.; the first appeared in THE IRON AGE of Aug. 14 and the second on Aug. 21.

INSTRUCTOR explains the crankcase and its parts to a group of service course students

Practical armature winding is on spare-time program of instruction

an Industrial Purpose

By FAY LEONE FAUROTE*

elementary economics and also gets a perspective of industry as a whole. In other words, the distinction between cooperative education and the ordinary kind seems to be just this: In the former, we try to lap-weld a man on industry; in the latter, we butt-weld him on. Some men will stand butt types of welding and some will not. The question requires analysis and, while the cooperative plan has its place, its extent is uncertain. Only actual experiment will determine the breadth of its application.

"Anyway, those who went to the ordinary type of school and were butt-welded on industry will appreciate the lap-welding.

"The part played by the teacher in the economy of life is, in many respects, quite analogous to that played by those who, in the industry, create articles or products for manufacture and sale. The teacher brings together knowledge and experience which have come down from many peoples and many lands. And by proper handling of these mental materials, he fits the products of his efforts for definite service to the rest of mankind. Service is undoubtedly the direct aim of all educational work; in fact, the law of the universe is service. Service is the road to usefulness, happiness and an effective life for young folks.

Latent Possibilities in Individuals

"With the rapid growth of industry, with the unprecedented increase in the size of our manufacturing and commercial institutions, and in the number of men employed; with the excessive emphasis which has been placed upon machinery and other equipment and upon methods and systems, it is not surprising that employers have overlooked the fact that in their employees they have unguessed resources of mental power, awaiting development.

"Progressive employers realize that the

AUTOMOTIVE electricity is covered by visual demonstration of the working of an instrument board and its connected apparatus

Taking down and reassembling motors and other parts of the cars serve to impart knowledge of parts and their functions

most substantial progress is to be made by a forward movement all along the line, in their own shops, by opening up the road along which each and every employee may travel toward the goal of greater skill and greater ability. Thus what the state requires and desires, for the welfare of the individual and society, industries need as a material asset to meet the competition of the future. Efficiency founded on intelligence must become the keyword of our business efforts.

"It is a comparatively modern idea in education that we learn best by doing; that there is greater development of quality achieved through the intelligently guided and instructed work of the hands than through the study of books or listening to lectures alone. The constant contact, which part-time schooling offers, seems to be just what is needed to tie up the schools with the actual occupations of the world. This is experience by doing things rather than knowledge by hearing words. Part-time courses make words and books real, by means of experience. They make facts real also, by relating them to life.

"In any community where people make a living at business and industry, and in the practise of the so-called professions, there is an opportunity for acquiring the practical 'work while you learn,' or 'learn by doing' features which characterize the cooperative schools. It means that, if young people who wish to learn business practically are given a chance, while still in school, to do a given amount of real work under business conditions, they will be ready quickly to perfect and adjust themselves when through school. Vocational education is being organized more and more on a cooperative basis, the school giving those phases, technical and social, for which it is peculiarly fitted, and the student obtaining practical experience under commercial conditions. By almost universal consent this represents teaching practice of maximum potency.

Putting a Meaning Into Studies

"Too often they are told that certain studies have hidden value in them, and that they should be pursued, regardless of immediate value. The boy has a right to demand that the school work should be meaningful. There is no warfare between theory and practice. The most valuable experience demands both, and the theory should supplement the practice and not precede it. The environment most conducive to securing and utilizing the most valuable experience is in the workaday world. But this is the very environment in which men often become engulfed in the practical, and neglect the theoretical. In every case, advancement is dependent upon the proper utilization of practical and theoretical experiences—upon the practical experience which is adequately interpreted.

"The right kind of education will not only get the boy into the job, but it will also get him out of it. The most valuable experience is therefore one which equips the man to compete with the skillful in the present and to comprehend his task, so that he may from time to time adjust it to new relationships. It emphasizes the formation of necessary habits, but does not neglect the development of the judgment.

"The universities and colleges, leaders of men, have therefore the obligation to assist at every possible point, so that industry may as rapidly as possible work out its salutary mission for the whole people. It was in this spirit that the College of Engineering and Commerce of the University of Cincinnati made its attack on the educational problems of industry.

Developing Initiative and Ability

"Briefly, the cooperative job is the student's laboratory in which he learns the details of his profession. It trains him to get the workman's point of view—to learn what he thinks and why. It places him in a position to weigh the relative demands which varied situations and experiences will make on his personality, and illuminates his own limitations and powers in coping with these situations. The cooperative plan aids the student to appraise and develop his personal qualities. Initiative has been defined as doing the right thing without being told, and ability as doing the right thing after being told once. Cooperative education develops both of these qualities.

Teaching Staff Well Equipped

"In building our research laboratory personnel, our section heads and principal research engineers are men of wide experience, coupled with adequate training. Their efforts have been supplemented by many younger men of limited experience, fresh from conventional engineering schools. Some of them are college graduates of four years' training, some are doctors of philosophy, some high school graduates, and some have not been through high school.

"Of all these younger men there are comparatively few who, given a problem and without great directive detail, could carry it through, find the solution and bring back a definite, consistent, well written report. They have never formed the habit of correlated study, and many of them are able to work only along the narrow lines taught by the text books. In the early days our mortality was somewhat high. We are gradually getting to the place where we pick men after long-continued scrutiny of their various characteristics, including suitability for research work, rather than have them do the reverse—pick us.

"For a number of years we had four or five pairs of University of Cincinnati co-ops in chemical engineering. During the war our laboratory was affiliated with a number of large industries. These Cincinnati boys handled thousands of samples of materials. Frequently checks were made on divided samples by as many as three or four different laboratories of acknowledged merit. The record of these young men was exceptional. We still talk about the type of service they rendered. We know by first-hand experience the value of the product.

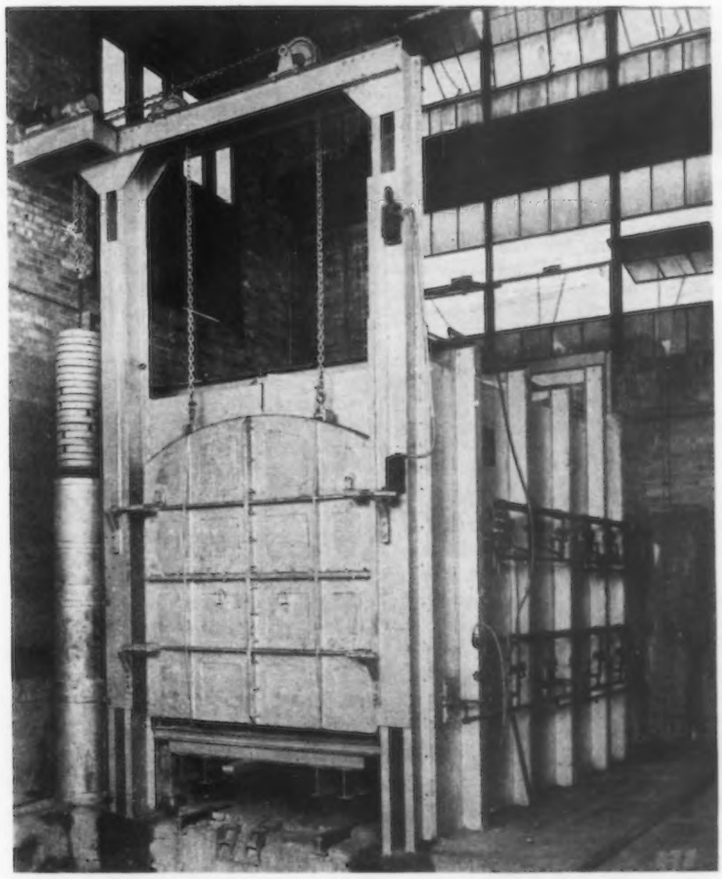
"At present we have many pairs of cooperative students in our plants at Dayton alone. One-half of the total number of students mentioned above come from our new venture within the corporation, the General Motors Institute of Technology, which is based upon this same fundamental of cooperative education."

Steel Treating in a Milwaukee Plant

Jobbing Shop, for Heavy Work, has Car-type Furnace with Steel Quenching Tank

IN the plant of the Wesley Steel Treating Co., Milwaukee, which does a jobbing business in heat treating, is the car-type of gas-heated furnace shown in the accompanying illustration. It is used interchangeably on annealing, normalizing, carburizing, hardening, etc. It was built by the Surface Combustion Co., Toledo, Ohio, and is of brick construction, encased in steel, and bound together with double channel buck staves. It is provided on each side of the car and at both ends to cut leakage of heat down through to the car mechanism to a minimum.

There are 22 two-stage velocity type burners, 11 on each side, staggered to provide both over and under firing. The control equipment consists of two sets of recording controllers with front dial settings, one set taking care of the upper burners on both sides; the other set, the lower burners



Single End Car-Bottom Furnace Used Interchangeably for Annealing, Normalizing, Carburizing and Hardening.

13 ft. in length, 6½ ft. wide and 5½ ft. from the car top to spring line of arch. The single door is of ribbed cast iron construction, lined with firebrick, counter weighted and lifted with a motor-driven hoist.

The walls are composed of 9 in. of firebrick and 7½ in. of insulation. The cars are of heavy steel members lined with 5 in. of firebrick and 2½ in. of insulation, and they are mounted on wheels equipped with roller bearings. Piers resting on the car deck carry a fire clay tile hearth, the tiles being 30 in. long, 12 in. wide and 4 in. thick, and held together with alloy angles and angle ties. The piers are also of firebrick checkered and extend entirely across the hearth. A sandseal is on both sides. These are connected to thermocouples in the furnace and control valves cut into the gas supply lines. The gas is raised to the desired pressure of 10 lb. through the use of a reciprocating compressor.

Flues are located near the top of the piers, passing through the side walls into two common ducts running the full length of the furnace on each side and then brought across, near the front of the furnace, to a common outlet, which is covered with a gas-cylinder operated damper. The piston in the cylinder is moved forward and back by means of the gas pressure in the main gas line and on the furnace side of the controller and control valve. Therefore, if the gas pressure is shut off this line entirely, the valve will close the damper. Through the use of this flue arrangement, the infiltration of cold air, through the furnace setting or doors when the burners are shut off, is eliminated.

After the charge has been brought up to temperature, the heating burners are turned off and the furnace is held at any desired temperature with the other burners. After the holding cycle is complete, all of the burners are shut off and the proper cooling down cycle established. When heating at the rate of 3100 lb. of work per hour in the furnace, plus 1340 lb. of brick, tile, etc., it is estimated that 7335 cu. ft. of 530 B.t.u. gas is required for a temperature of 1850 deg. Fahr.

Quenching Done in Steel Tank

A steel tank 13 ft. long, 8 ft. wide and 10 ft. deep sets in front and contains the quench. Between the two is a large platform on wheels and three tracks, which sets below the level of the tracks in the furnace. The furnace cars are shifted back and forth on this platform. Overhead is a 50-ft. crane of 3 tons capacity. An oil quench is employed and is agitated with a motor-driven impeller. Two sets of water coils, one on each side, are placed in the sides of the tank and closed off. The impeller causes the oil to flow through these compartments and out again so as to come in contact with the cooling surfaces. A cage of steel screen sets in the tank and holds the work as it is dropped in. This cage is handled with the crane.

Special Alloy Used in New Machinist's Hammer

SOFTNESS combined with unusual durability is claimed for a new "copper bronze" machinist's hammer which has been brought out by the Bunting Brass & Bronze Co., Toledo, Ohio. The tool is regularly made in 1 and 2-lb. sizes, but other sizes can be furnished. The handle, of hickory, is proportioned to provide proper balance, and may be replaced conveniently when broken.

Foundry Equipment Orders Declined in July

Orders for foundry equipment in July, as reported by the Foundry Equipment Manufacturers' Association, were equal to 90.6, compared with 102.1 in June and 92.7 in May. The figure 100 represents average monthly shipments for 1922, 1923 and 1924. Shipments in July were 116.1, compared with 160.5 in June and 149.4 in May. The association's three-months' average of gross orders is 95.1.

Unfilled orders at the end of July were 139.1, compared with 166.7 at the end of June. The high point for orders this year was 196.4 in February. The association's report is based on returns from 20 manufacturers of foundry equipment.

New Double Seaming Machine

Compact Semi-Automatic Unit Has Anti-Friction Bearings and Splash Lubrication—Three Types of Feed Furnished

FOR round drums, pails, tubs and similar containers not exceeding 22½ in. in diameter and not over No. 18 gage in thickness, the E. W. Bliss Co., Brooklyn, N. Y., has developed a new semi-automatic double seamer designated as the No. 220. Use of anti-friction bearings and splash lubrication, with lessened power requirements, are major improvements.

The machine comprises a self-contained seaming head bolted to a column that has a machined front face to which may be gibbed a footstock or a work-holding knee. The head, a one-piece box casting, carries the work spindle, driving shaft and roll slides together with the automatic feed mechanism for the latter. All fast running shafts are mounted on ball or roller bearings. The drive shaft and feed mechanism are oiled by splash, while the Timken-equipped work spindle is grease packed. The cams and worm gear run in oil.

The cams operate a pair of steel feed levers at the back. These are connected to the slides by long ball screws, making adjustment convenient. The slides are surface ground, and in addition to the usual guide they have their top faces and the upper part of the side faces guided all the way out to the spindle. This improvement is stressed as an advantage, especially, on small diameter work. Rolls are made of special steel, are double grooved for longer life and are mounted on Timken bearings.

To permit the small vertical adjustment necessary to bring the chuck to the level of the seaming rolls, the work spindle is mounted in a quill. The flanged spindle nose has four tapped holes for attaching the chuck, and also has a 2-in. chuck centering pilot which takes the roll pressure. At the right of the head is a vertical splined shaft for actuating the various work-holding devices, and a handle for tripping the feed clutch. The latter is omitted on dial feed machines.

Means for changing the feed rate to suit the requirements of the work are provided in the form of a system of change gears which gives a range of 5 to 16 turns of the spindle for the first seaming roll and proportional differences in the time for the entire cycle.

Seamer with Single-Spindle Footstock Adapted for Limited Production

Three types of feed, all using the standard seaming head, have been developed for this machine. The seamer designated as the type *A*, with a single-spindle footstock, is the simplest and, being easiest to change over, it is most suitable for limited production. It is also preferred for large thin drums which require careful assembling of body and head.

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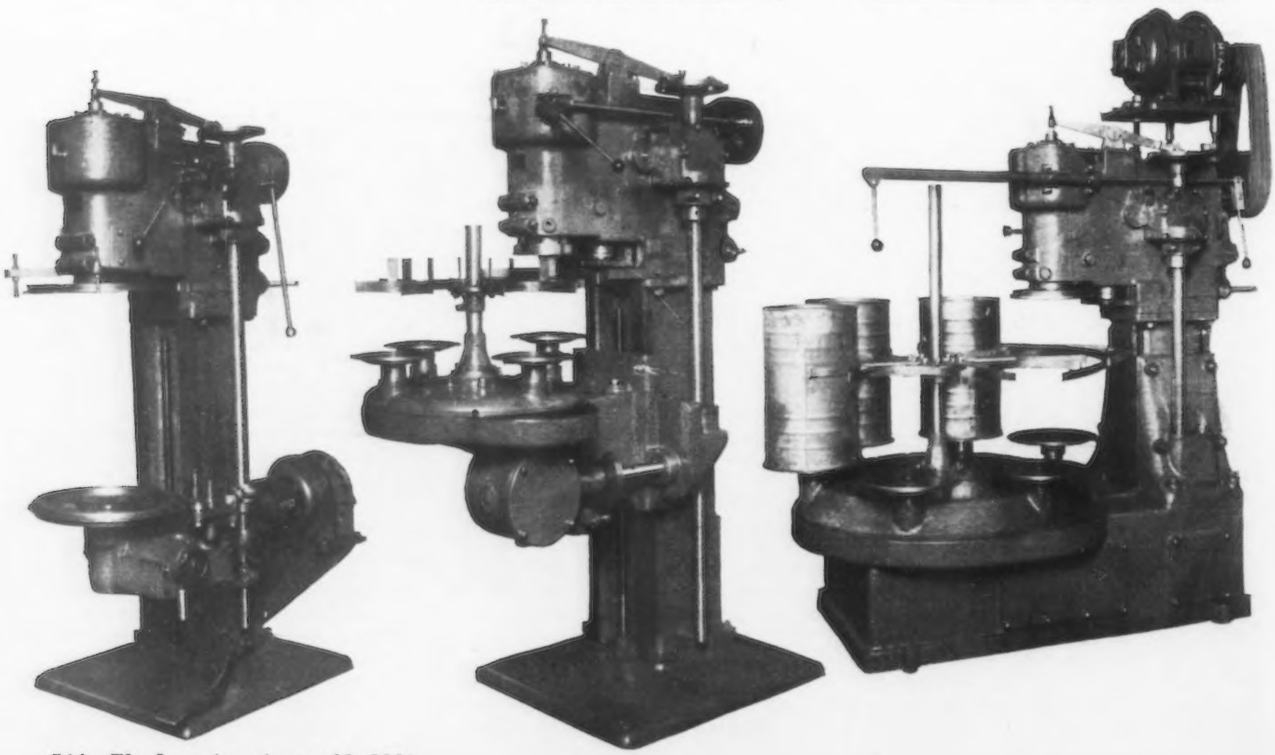
THREE Types of Feed Can Be Furnished. The type A seamer has a single-spindle footstock, the type B has a four-station dial feed; and type C has the dial built into the base

In operating this seamer the work is placed on the bottom chuck and then raised by means of the treadle into contact with the revolving top chuck. As soon as the work is seen to be running true, the operator trips the feed clutch, after which operation is automatic. At the end the footstock spindle drops, the knock-off pushes the work off the top chuck and the feed stops.

The screw elevated knee of this machine permits full adjustment for height and for vertical pressure to drive the work. The footstock spindle is flanged and piloted, and runs in a vertically slidable quill upon a ball thrust bearing, the latter being spring mounted to compensate for small variations in height of the work. The footstock quill gets its vertical motion from a pinion shaft extending to the right. At its end there is a sprocket carrying a chain attached to the treadle. If change is to be made in the location of the footstock, the operator lifts the chain off the sprocket, sets the footstock and then puts the chain back at the place giving the best treadle position. No tools are needed for this operation.

Inside the sprocket is another pinion and rack reaching back to the elevating cam. This cam holds the work up during the operation and lowers it at the proper time. The cam is slidably keyed to the vertical shaft and requires no attention during height adjustment. To make the treadle work as easy as possible for the operator, the pinion shaft is mounted on ball bearings and, when heavy chucks are used, counterweights are added to the treadle.

Work 22½ in. by 36 in. high, No. 18 gage, is within the capacity of the model A machine. Production varies with character of work and with the



Steel Output Higher Than Demand Requires

BY LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

THE apparent maladjustment between steel production and the indicated requirements of the chief consuming industries continued to exist during June and July, but some trend toward improvement is suggested by the fact that the preliminary July figure for the composite demand line shows a less rapid decline than that for June. Probably it will be something less than 90 per cent of the average for 1921-1927, against 93 per cent in June.

In June, activity in the chief lines of steel consumption showed a declining trend, including exports. There were notable reductions in the indicated current requirements of the railroads, building and construction, and automobile producers. Rarely do we find so broad and general a recession. In July, however, the adjusted indexes of two major items made a somewhat more favorable showing, namely, railroad freight traffic and building activity. To be sure, these were small and were more than offset by further sharp decreases in automobile production. The low level of machine tool buying is an unfavorable indication, and there is reason to believe that general manufacturing and mining figures, when available, will further reduce the July index. But any checking of the decline in certain important factors gives the preliminary July figure a little more hopeful aspect.

Meanwhile, however, steel production has continued out of line to a considerable extent. Although here, too, one may point to a sharp readjustment which has reduced the excess, the adjusted steel index is over 98 per cent of the average for 1921-1927, or about 8 points above indicated current requirements. It does not seem probable that sustained recovery can develop until the steel production curve falls below the composite demand line, as it did in 1921, 1924, and 1927.

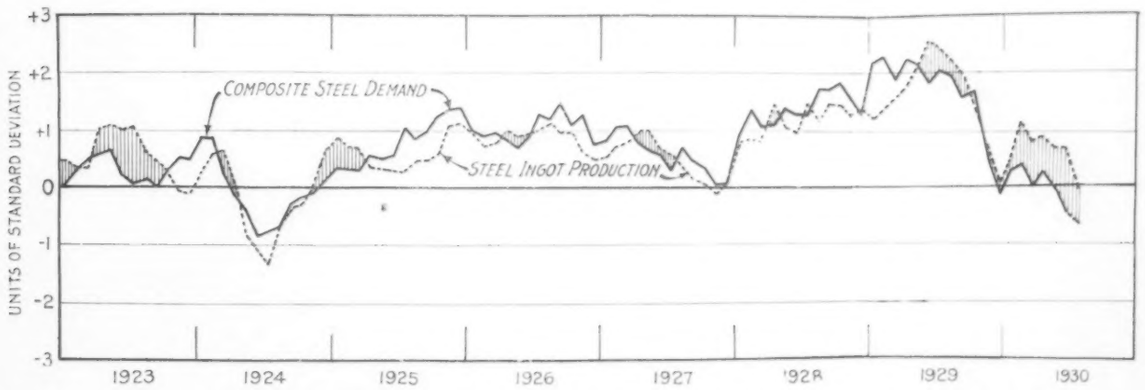
Of course, the readjustment might come through an increase in the activity of the consuming industries. What is the outlook? We find hardly any basis for anticipating a more than seasonal recovery in steel demand this fall, and very little chance for as much seasonal expansion as is the normal expectation.

Perhaps the outstanding factors to consider are agriculture, railroads and the automobile industry, for these three are interrelated. Agriculture is suffering from low prices for the chief crops, and considerable damage to corn, hay, and certain vegetables and fruits (e.g., sweet corn and tomatoes). The drought may help the holders of surpluses carried over from last year, and a few sections or interests, but what it gives to some it more than takes away from others. The agricultural implement trade, and sales of wire, sheets, etc., will probably be affected unfavorably.

The railroads are being injured directly by reduced crops, and indirectly by reduced farm purchasing power for automobiles and equipment, to say nothing of the reaction upon the general purchasing power. The July earnings of the carriers now coming in are not encouraging. They may be able to carry through their normal programs as to rails, but neither their experience with the speeding up process last spring, nor their present financial outlook, makes the full normal purchasing program probable.

Of building, it can still be said that it is probably at bottom levels and likely to make some recovery before long. July figures show a slight upturn in "permits" and in "contracts awarded" (as measured in floor space). There is reason to suppose that the orders for fabricated structural steel will hold up fairly well.

The really bright spots, however, seem to be found in the demand for line pipe and for road building materials.



Spread Between Production and Demand Lessened but Past History Requires for Recovery a Crossing of the Two Curves

This Issue in Brief

Production costs will be hammered extensively during coming months, Fritz J. Frank believes. Causes: Large production capacities, increased capital structures, and international competition. Needs of industry have been specially studied by THE IRON AGE. Results of study will be put into effect beginning with the Sept. 4 issue.—Page 545.

* * *

Failure of die casting die steels is caused by constant alternating expansion and contraction of surface in contact with molten alloy. The surface checks, then hot alloy enters and is forced deeper by every shot.—Page 546.

* * *

Where high tensile and impact strength and resistance to wear are essential, silicon steel castings are suitable. Molds should be well dried and have ample sink heads.—Page 549.

* * *

Warns against pouring certain cast chromium steels at high temperatures. Chromium oxide film forms over liquid and becomes entrapped in casting. Use a very porous and refractory sand, lightly drying the surface, and pour rapidly.—Page 598.

* * *

China offers a tremendous potential market for tin plate and can-making machinery. Canning of surplus crops in some sections would relieve famine in others.—Page 556.

* * *

Manufacturers will make most substantial progress, says Kettering, by helping employees along the road to greater skill and greater ability. Many employers overlook the fact that in their employees they have unguessed resources of mental power awaiting development.—Page 561.

Electric controls for hotbed and tables of new bar mill are installed in room below the floor. This arrangement leaves the mill remarkably free of obstructions.—Page 558.

* * *

Complicated die casting dies seem to give best service. Dies with large flat, unbroken surfaces check most rapidly. Alloy steel dies make longer runs possible.—Page 548.

* * *

Tools required for new jobs are decided upon by shop committee. Completed tools go to tool storage in the departments in which they will be used, and are then assigned numbers by the tool-crib supervisor. Planning department records prevent the redesign of identical tools on future occasions.—Page 552.

* * *

Spongy iron in heavier sections of iron castings is eliminated by increasing the weight of the metal charged into the cupola. The average jobbing foundry uses a charge weight of approximately 11 per cent of the cupola's melting speed per hour. On all but very light work, 15 per cent would give better results.—Page 554.

* * *

As you increase your charge of steel into the cupola, be sure to step up your coke charge proportionately. Otherwise it will not be possible to maintain an even ratio between charges. For the steel picks up carbon from the coke.—Page 554.

* * *

Are one-piece dies more satisfactory for die castings than built-up dies? The latter may change dimensions due to loosening of bolts, screws, etc. But the solid die has a wide range of steel thicknesses, an obstacle to successful hardening.—Page 548.

To prevent brittleness in chromium steel castings, allow them to cool in the mold only to a dull red, and then anneal to remove the stresses.—Page 598.

* * *

Fulfills delivery promises by appointing a representative in each department to cooperate with supervisory staff, whose duty it is to see that deliveries are made on time. Close tie-up between operating departments and delivery supervisors cuts redtape, hastens decisions, affords more dependable delivery forecasts, cuts delivery time.—Page 550.

* * *

Improves strength of copper steels by heat treatment. Heating at 650 deg. C. is said to increase tensile strength, elastic limit, and hardness. Probable reason: Copper is separated from the iron-copper solid solution.—Page 551.

* * *

Questions value of school studies with only "hidden value." "The boy has a right to demand," says Charles F. Kettering, "that the school work should be meaningful." Practical experience should be given at the same time theory is taught. Lack of correlation produces students who find it almost impossible to think a problem through.—Page 562.

* * *

Automatic damper keeps cold air out of heat-treating furnace. When gas pressure is shut off a valve, operated by gas pressure, closes the damper.—Page 563.

* * *

Tests reveal that type of slag entirely different from that ordinarily used may give best results in ferromanganese manufacture. Bureau of Mines hopes to present data which will enable operators to produce quality material at a lower cost.—Page 555.

organization and handling facilities of the shop. In one case, on a drum 15 in. in diameter, 26 in. high and of No. 20 gage material, production of seven seams a minute was obtained. A well planned system of roller conveyors was used.

The type B seamer has a four-station dial feed and is for work up to 15¼ in. in diameter by 26 in. high. Dial indexing and rise and fall of the work are automatic. The entire dial mechanism is contained in the knee. The machine runs continuously and therefore the treadle and feed clutch are omitted.

In the third type of this machine, the type C, the four-station dial, takes 22½-in. diameter work and with the six-station dial it takes work up to 18 in. in diameter. The height range is from 18 to 36 in. The dial is built into the base and the work, therefore, has a constant height. The machine may also be set with the bottom chucks flush with the floor, an arrangement which facilitates handling and lends itself better to a conveyor system. Height range is obtained by adjustment of the head vertically on the column. With this arrangement it is preferable to mount the driving motor on the head as illustrated. Dial indexing is at the rate of 12 per min.

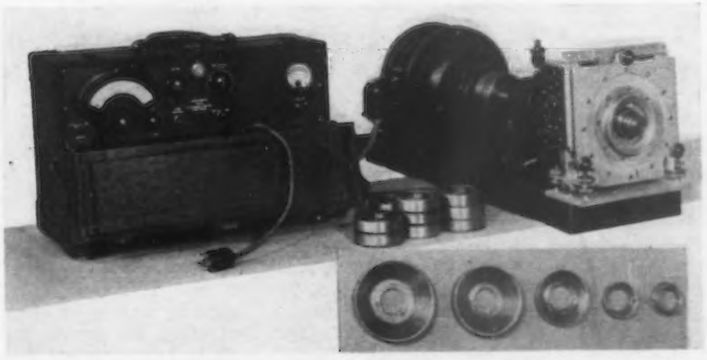
Tests Ball and Roller Bearings

Acoustimeter for Use in Shop Designed to Detect Undesirable Vibration and Permit Accurate Sorting

FOR scientifically determining the quality of ball and roller bearings the Burgess-Parr Co., 111 West Monroe Street, Chicago, is offering the Burgess bearing tester, which is an acoustimeter designed to detect the undesirable vibrations of a bearing by means of an electrical pick-up and amplifying circuit and an electrical meter.

This testing is simple and direct, and is said to be as rapid as listening by ear, with marked savings in time in definitely determining the quality of "border line" bearings. The instrument is so adjusted that a bearing considered to be excellent barely causes a deflection of the meter needle, while a defective bearing produces a full scale reading. Bearings of intermediate quality produce readings between these limits, the amount of the deflection indicating the quality of the bearing. It is stated that the instrument is so built that only those vibrations indicative of bearing quality affect the meter reading, extraneous noises and those mechanical vibrations which do not affect bearing quality being ignored. The instrument, therefore, can be located in the factory, thus eliminating the necessity for a soundproof inspecting room and the cost of hauling the bearings to and from the soundproof room.

This bearing tester, developed by the C. F. Burgess Laboratories, Inc., is of wide range and can be operated by unskilled labor. In addition to classifying bearings, it may be used for studying design and construction of ball and roller bearings.



Ball and Roller Bearings May Be Sorted Quickly. Undesirable vibration is detected by means of an electrical pick-up and amplifying circuit. The electrical meter indicates the amount of such vibration

Continuous-Type Filing Machine

FOR the rapid and accurate filing of dies, special tools and miscellaneous parts, Grob Brothers, West Allis, Wis., are offering the filing machine illustrated, the cutting action of which is continuous.

In filing parts having internal holes, such as blanking and trimming dies, it is only necessary to disconnect a notched link of the file chain, which is done by releasing the tension adjustment and withdrawing a connecting pin. The work is then positioned on the table, the filing chain is drawn through the hole of the die and again connected, and the filing chain tensioned by means of the handwheel at the top of the machine.

The machine has a semi-steel frame. The filing table, which measures 16 x 20 in., is mounted on the frame by means of two hinge-pins and can be tilted 22½ deg. in either direction by releasing one nut. An indicator finger attached to the table, together with a graduated plate mounted on the side of the frame, permits accurate angular settings.

The continuous file chain is made up of a series of links which operate on two sheaves. One sheave, located in the base, is the driver and the other, in the head, is the idler. A heavy helical spring is used to maintain the proper tension and to act as a cushion for maintaining a uniform

drive. The links to which the files are welded can be replaced merely by removing two pins, and the entire filing chain may be removed easily by releasing the tension of the sheaves and withdrawing the chain through the back or the bottom of the machine. Either flat, half round, or special filing chains may be used.

A feature emphasized is the method of driving the filing chain, a Tex-rope reduction drive being employed. The motor pulley is belted to a countershaft, which through a second belt drives the lower sheave of the chain drive. The countershaft is so mounted that when pressure is applied to the filing chain, a torque is developed which causes the driving belt to tighten. Thus, it is claimed, additional pressure applied to the face of the files increases the tension of the belt, giving a more positive drive.

Three speeds, 170, 195 and 220 ft. per min., are obtainable through the three-step drive pulleys. The back slide against which the links of the filing chain operate is made of hardened steel and is replaceable. It is attached to the machine frame by two bolts. An adjustable slide on the table permits taking up any gap between the table and the filing chain. This adjustment is only required when the table is tilted. The guide that supports the filing chain, located directly above the table is adjustable.

Pratt & Whitney Co. Buys John-Sons Gage Works

C. R. Burt, president and general manager of the Pratt & Whitney Co., Hartford, Conn., has announced the purchase of the John-Sons Gage Works of Hartford, manufacturer of screw thread gaging equipment.

Arrangements are being made to transfer all the machine equipment and present stock to the Pratt & Whitney plant. It is planned to continue the manufacture of the various gaging products produced by the John-Sons Gage Works under the Pratt & Whitney name, as under the terms of purchase were included all patent and manufacturing rights, as well as the good will of the John-Sons concern. C. V. Johnson, Stanley Johnson and Paul Johnson, owners of the John-Sons Gage Works, together with the entire trained personnel of the company, will be associated with the Pratt & Whitney Co.

C. M. Pond, director of Pratt & Whitney and manager of the small tools and gage divisions, will have supervision over this new branch of work.

Foreign Trade Conditions Favor United States

"Throughout the world countries are buying a larger share of their foreign purchases from the United States than before the war," declares the National Industrial Conference Board, 247 Park Avenue, New York, in a study just completed entitled "The Trend in the Foreign Trade of the United States."

These purchases, with the exception of those of the Far East, consist more largely than before of manufactures. This is true even in the case of Europe, although the increase in the proportion of manufactures in Europe's purchases from the United States has been largely due to increased purchases of refined petroleum rather than fabricated articles. On the other hand, the limited market for automobiles in China and Japan and increased exports of cotton to those countries have brought about a reduced proportion of manufactures in the exports of the United States to the Far East.

In this connection the Conference Board points out that exports of the United States are likely to be less affected than those of European countries by industrial progress in the less developed countries of the world. Aside from the refining of the crude products of their extractive industries, such as the milling of flour, countries ambitious to develop fabricating industries as a rule promote the manufacture of articles which have the broadest local market—clothing and textiles, footwear, and simple household goods. The Conference Board's analysis of the import trade of such countries reveals that, except in the case of Canada, they have been importing commodities of this character chiefly from Europe rather than from the United States. On the other hand the industrial program of these undeveloped countries requires machinery and equipment which they cannot profitably manufacture themselves and which can often be bought to advantage in the United States. Analysis of United States exports indicates that other countries turn to this country chiefly for its machines, productive equipment, and somewhat less generally for other kinds of iron and steel products. The general effect of fostering home industries in backward countries, according to the Conference Board, will be to discourage purchases of the goods bought most extensively from Europe, and to encourage purchases of the goods bought most extensively from the United States.

Gulf States Starts New Sheet Mill

Commercial operations are being started at the new sheet mill recently completed by the Gulf States Steel Co., at Alabama City. The mill was designed for a capacity of around 7000 tons a month, but the maximum capacity is expected to run as high as 10,000 to 11,000 tons a month. It is designed to make black, blue annealed and galvanized sheets, including crimped or corrugated roofing and siding.

Structural steel for the buildings was furnished by the Ingalls Iron Works Co. and the Virginia Bridge & Iron Co. The Falk Corporation furnished mill drives; General Electric Co., main motor and part of auxiliary motors; Wheeling Mold Foundry Co., Wheeling, W. Va., three-high mills; Hardie-Tynes Mfg. Co., Birmingham, two-high mills, cold mills, and tables; Flinn & Draffein Co., Chicago, furnaces; Harnischfeger Corporation, Milwaukee, cranes; Tennessee Coal, Iron & Railroad Co., steel castings; Wean Engineering Co., Warren, Ohio, and Peebles-Mehan Co., Ashland, Ky., galvanizing equipment; Streine Tool & Mfg. Co., New Bremen, Ohio, Long & Allstatter Co., Hamilton, Ohio, and United Engineering & Foundry Co., Pittsburgh, shears; Aetna Standard Engineering Co., Youngstown, Ohio, pickling equipment, and Sutton Engineering Co., Pittsburgh, leveling machines.

Range Boiler and Expansion Tank Simplification

The simplification program on range boilers and expansion tanks has reaffirmed the existing schedules, without change, for another year. This action was taken by the standing committee of the industry and has been announced by the Division of Simplified Practice, Bureau of Standards. A survey of production indicated the degree of adherence to the recommendation to be approximately 98 per cent for range boilers and 99 per cent for expansion tanks.

Algoma Increasing Rail and Structural Capacity

The Algoma Steel Corporation, Sault Ste. Marie, Ont., is carrying out a building program which when completed will represent an expenditure of approximately $1,500,000. Special attention is being given to the reconstruction and installation of modern equipment in the rail mill. While considerable new equipment will be purchased and installed in the present rail mill, it is understood that some of the equipment will later be moved to a new building. According to present plans the proposed enlargement will be completed and the plant ready for production immediately after the turn of the year.

Up to the present the Algoma rail mill has been limited to the production of 100-lb. rails, but when the new plant is ready it will be in position to turn out rails up to 150 lb. to the yard. In addition to extending its rail production capacity, Algoma is also providing for increased output of structural shapes. The new plant, when completed, will be able to produce shapes up to 15 in.

Dealing with the company's proposed structural steel activities, J. D. Gray, general manager of sales, stated that in the early future Algoma would be in a position to supply a large part of the requirements of Canada. Steel used in the construction of the majority of buildings in this country does not exceed 15 in., and, with adequate tariff protection, the company would look to obtain a large share of the available business.

In 1920 imports of structural steel of 35 lb. to the yard and over amounted to 96,895 net tons; in 1921 imports fell off to 45,828 tons, but since that time have been increasing year by year until in 1927 they totaled 118,082 tons and for the fiscal year ended March 31, 1930, amounted to approximately 370,000 tons, of a value of upward of $14,500,000.

When the new Algoma plant is completed, the company believes it will be in a position to supply a large part of the structural shapes formerly supplied by the United States.

Commodity Prices Lowest Since 1916

Wholesale prices of commodities, reported by the United States Bureau of Labor Statistics, had an index of 84 in July, compared with 86.8 in June, and with 98 in July, 1929. The most recent figure is the lowest which has been recorded since 1916.

Except for house furnishing goods, all of the principal groups showed declines, some of them drastic. Metals and metal products dropped from 95.4 in June to 94.3 in July. This was brought about by a drop of one point in iron and steel, 4.6 points in nonferrous metals and a small fraction in agricultural implements. Automobiles and other metal products remained unchanged from June.

Conservatism of Automobile Makers Has Been Underestimated

DETROIT, Aug. 25.

ALTHOUGH automobile production this month is likely to show some gain over July, the improvement is not reflected in specifications and orders for iron and steel. The generally accepted interpretation of the present situation is that consumers have cut stocks almost to the vanishing point so that any pickup in business would be felt immediately by the steel mills in the form of increased bookings. This, however, has not been the case. When so many automobile plants were closed during July, it was predicted that the resumption of activities would provide the steel trade with some much-needed tonnage. With much blare of trumpets well over 100,000 men were reported going back to work early in August, but the expected demand for steel failed to materialize. What is the explanation?

The answer is to be found largely in the cautious policy of the automobile industry and in the fact that several automobile plants evidently had accumulated some stocks during the period immediately preceding the wholesale shutdown in July. One of the leading makers of low-priced cars, for instance, is reputed to have bought steel and had it delivered in early July at a rate which called for an output of automobiles considerably higher than it actually turned out. This meant that some steel was carried over for use after the vacation period. This company has been virtually out of the market all of this month, so far as new commitments are concerned, and will not be placing fresh orders until after Sept. 1.

The conservative production policy now ruling the industry also has manifested itself in lower operating rates this month than many manufacturers had anticipated. Here again the tonnage of steel moving to the Detroit district has been adversely affected. The prolonged period of waiting for business to develop has been particularly hard on the sheet steel people, whose output in full-finished grades has declined to a low point. Consumption of strip steel also has fallen to an alarming extent. Sheet mill schedules have suffered from the lack of orders and two producers in this district were closed the past week. One intends to get back into production this week, but the other will extend its shutdown for seven more days.

Much the same situation is to be found in pig iron. Some automobile foundries made enough castings before the shutdown to take care of assembly needs for several weeks after resumption. This has meant that pig iron shipments have not turned upward as rapidly as had been hoped for. In a number of cases the tonnage delivered this month is running about 15 per cent ahead of July, but it is doubtful whether the foundry melt in this district, considered as a whole, will show a corresponding gain.

It is only a comparatively few foundries supplying Ford, Buick, Cadillac and possibly two or three other makers, that are really busy. Other automobile foundries are on poor schedules and jobbing foundries likewise have only enough work to operate one or two days a week. The Chevrolet foundry is planning to close for about two weeks early in September preparatory to beginning the manufacture of castings for the 1931 cars. The Oakland-Pontiac foundry is down until after Sept. 1.

Small Car Competition Intensified

THE return of William C. Durant to the active direction of Durant Motors, Inc., marks the first move by American automobile companies to recognize the competition of the American Austin car. The news that the Durant company has contracted with American Mathis, Inc., to build 100,000 Mathis cars of French midget size has aroused much interest in Detroit. The Mathis will be larger than the Austin, but smaller than a Ford, and probably will sell for about the same price as the Austin.

Although the Austin has succeeded in putting itself into the spotlight because of its marked difference in size as compared with other cars, local observers do not believe that it will take with the American public. They are of the opinion that its market is narrow in scope, being limited mostly to the light delivery business, and that for most purposes the average car owner prefers to drive a larger, heavier car.

The price of the Austin is not appreciably lower than a Ford, but the fact cannot be denied that the Austin is getting orders which otherwise would go to American makers in the low-priced field, that its showing and its future possibilities are sufficiently good to lure another company into building a competitive line and that its entrance into the American market has intensified the battle for automobile business. It is interesting to note that the present line of cars made by the Durant company will be continued.

There has been no improvement in the automobile industry. Output continues close to 70,000 cars a week, with Ford making perhaps 40 per cent of the total. Ford is operating 4 days a week at a reported rate of 8000 cars daily. Chevrolet has been holding to 3000 to 3500 cars a day, 5 days a week, but its production is likely to taper as various departments clean up their work on the present car and get ready to start on the 1931 models. Incidentally Chevrolet is said to be eager to get out its new line as soon as possible, but this is not likely to be before Dec. 1. Nevertheless the precedent of waiting until the January show will be broken this year.

Buick looms strong with a schedule of 850 cars a day, 5½ days a week. Its August schedule of about 20,000 cars will carry over through September. Cadillac-LaSalle is active supplying dealers with the new Cadillac V-eight and LaSalle models. The Cadillac V-16 is a big success. The new 12-cylinder job will not be put on the market until October or November. The Oakland-Pontiac factory is said to be practically at a standstill until the first of the month. Other automobile makers have virtually the same operating rate as a week ago.

It is not believed that the recent cut in prices by several manufacturers has aided retail sales, which have suffered from the usual seasonal decline accentuated by the current industrial depression. In some circles it is thought that the slashing of prices has done more harm than good, because buyers now are reluctant to make purchases until they find out whether certain makers are to bring out new models or until there is a further drop in prices. In either case, the result is a slowing down of automobile sales.

Most people who are following the automobile industry closely believe that this year might as well be written off the books now; that is, the situation holds nothing which would point to a pickup until 1931. Therefore, steel makers furnishing the automobile trade with substantial tonnages are not entertaining the hope of a real upward trend this year and certainly are not counting on much tonnage from Detroit in the months just ahead.

Great Lakes Open Hearths Begin Operations

THE open-hearth furnaces of the Great Lakes Steel Corporation at Ecorse began taking pig iron the middle of the past week from one of the Zug Island furnaces of the Hanna Furnace Corporation. Temporarily

cold pig iron is being supplied, but hot metal will be transported in large ladle cars within a short time. Operation of the new hot-strip mill of the Great Lakes company will begin in September with initial deliveries scheduled after the fifteenth of the month.

Deliveries Getting Speedier

WITH steel makers scrambling for business and consumers disinclined to carry inventories, much depends on the speed with which deliveries can be made to Detroit, so far as getting steel orders are concerned. Mills nearby obviously have some advantage over others far distant, but the latter have paid such close attention lately to getting their material into the hands of customers quickly that much of this advantage has disappeared.

A case in point is a mill located some 300 miles from Detroit. It has some large accounts in this district and therefore finds it necessary to deliver all tonnage promptly, as well as to meet unusual situations which arise from time to time. It is said that this mill puts sheet steel into Detroit by rail approximately 15 hours after a shipping release is received from the customer. This is not an exceptional instance, but a regular occurrence. In recent weeks it has been resorting to airplane transportation to deliver samples to customers who have special problems to solve quickly.

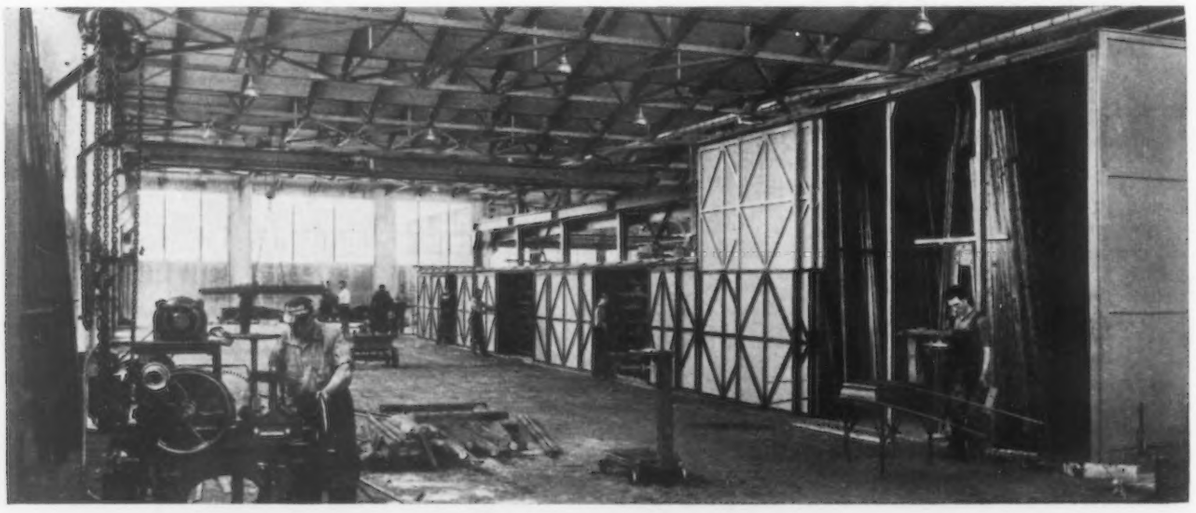
This calls to mind the fact that pig iron melters 100 to 150 miles from Detroit often telephone pig iron offices here early in the morning to find out the analysis of material just delivered to them. They have placed orders by phone late in the afternoon of the previous day and railroad freight deliveries are so speedy that the carriers have got shipping instructions, loaded the cars, transported them to their destinations during the night, switched and unloaded them in consumer's yards in the morning before the mail containing the analysis of the iron has arrived.

Opening of New Steel Warehouse Marks 140 Years for Providence Jobber

IN 1790 Joseph Congdon began to trade in iron, catering to the needs of the Colonial folk of Providence, R. I. During the 140 years since that time, the Congdon family has been engaged in the same business, with only one major change in name. In 1854 Francis Wood Carpenter became a member of the firm, which has since been known as the Congdon & Carpenter Co. Besides celebrating its 140th anniversary, the company has opened in Providence a new steel warehouse which embodies some of the best ideas that its experience has taught.

One of the features of the new warehouse is the enclosed and heated rooms for cold-finished steel, the heat being provided to prevent rust by preventing the deposition of moisture. (Upper illustration.)

A horizontal rack for hot-rolled steel is shown in the lower illustration. This rack is low enough so that a man can reach any part of it from the floor. It is also so strongly constructed that hundreds of tons of bars can be placed on top, thereby utilizing space that is normally useless.



Lower Pipe Rates to Southwest

Interstate Commerce Commission Examiner Recommends 28½ Per Cent of First Class Rates

WASHINGTON, Aug. 26.—In one of the most voluminous reports on rate cases ever handed down, Examiner R. G. Taylor of the Interstate Commerce Commission, in a report made public last Thursday, recommended adoption of 28½ per cent of the Southwestern first class rates on wrought iron, steel, and cast iron pipe from producing points to Southwestern consuming points.

He also proposed 28½ per cent of the Kansas-Missouri rate from Southeastern origins to destinations in Kansas-Missouri territory on cast iron pipe and related articles and a similar basis plus differentials from Southeastern origins to destinations in Kansas west of Kansas-Missouri territory on cast iron pipe and related articles.

On rolled and cast iron pipe from Milwaukee to destinations in Southwestern territory west of the Neosho, Mo.-Laredo, Tex., line, the examiner said that the Chicago basis of rates should apply. On traffic to destinations east of that line permission should be granted to maintain a differential of 1.50c. per 100 lb. over Chicago for a period of six months, following the effective date of the rates prescribed, the examiner said. The differential of 1.50c. on pipe, Youngstown, over Lorain, Ohio, would also be maintained for six months after the new rates became effective.

The carriers, in readjusting Southwestern cases, had proposed a basis of 32½ per cent of the Southwestern first class rates, which would be considerably higher than existing commodity rates.

Under the present rates on pipe, Milwaukee almost invariably takes the same basis as Chicago on traffic to the Southwest.

The report said that competition is so strong in the sale of pipe that a small difference in delivered prices will swing the business to the lowest bidder. Also from the economic standpoint, it was stated, pipe producers in the Mahoning-Shenango Valleys and Pittsburgh districts are perhaps more favorably situated, the producers in the Chicago district paying approximately $2 more a ton for skelp than in the other districts. It was stated that the proposed differential, Lorain over Chicago, of 9c., is less than the difference which Chicago producers must pay for the raw material.

Lorain was considered the key point, because in endeavoring to sell pipe in the Southwest it was explained that, measured by the freight rate, that point is the producing point on which prices are ordinarily predicated. The existing differential from Chicago over St. Louis to Texas points is 8c.; from Lorain it is 24c. and from Pittsburgh 29c.

To show the growth of wrought pipe tonnage from manufacturing points to Southwestern consuming territory, it was pointed out approximately 45 per cent more pipe moved to the Southwest than general iron and steel articles in 1928. This was declared to justify removing pipe from the general iron and steel rate classification.

Further Reduction in Automobile Output

WASHINGTON, Aug. 26.—Output of motor vehicles in the United States reached the low mark of 262,363 units in July, being the smallest since last December's total of 120,007. In view of the fact that a large portion of the industry was shut down, the small production of July had been anticipated. There was a decrease of 73,114 units from the June output of 335,477.

Production in July was made up of 222,459 passenger cars, 39,663 trucks and 241 taxicabs, compared with 289,245 passenger cars, 45,773 trucks and 459 taxicabs in June.

In the first seven months the output totaled 2,481,911, against 3,726,283 in the like period of last year. Passenger car output in the first seven months of 1930 was 2,117,465 units, against 3,182,241 in the corresponding period of last year, and truck production totaled 359,684, compared with 526,355.

Production of motor vehicles in Canada in July totaled 10,188, against 15,090 in June, and included 8556 passenger cars and 1632 trucks. In the first seven months of 1930 motor vehicle production in Canada totaled 120,873 units, against 205,822 in the same period of last year.

Makers of Rail Steel Bars Coordinate Improvements

Problems relating to production and marketing policies were given special attention by members of the Rail Steel Bar Association which met Aug. 7 and 8 at Hamilton, Ont. Special attention was given to internal economies of the rail steel industry, such as deal with the standardization and improvement of administration and production factors, purchase and sale contracts, accounting and cost keeping methods, insurance and compensation plans and safety control.

Quality marking of reinforcing bars, now widely advertised to the consuming trade in architectural and engineering journals, and by which all rail steel reinforcing bars produced by member mills are marked with a uniform association symbol, was a subject for considerable discussion. Following in general the procedure established by the Department of Commerce, the members of the Rail Steel Bar Association identify their reinforcing bars as having definite standard quality and are now listed as "willing to certify" in the Bureau of Standards list of standard commodities and their producers.

Also reviewed at this meeting were methods that have been established to maintain and improve the quality of rail steel bars produced by the associated mills. This work has been conducted by the works managers division of the association.

In order to supplement this work and relate production more directly to marketing, there has been established a committee on metallurgy and production. This will be composed of the chief metallurgists of the various mills, who will act under direct supervision of the executive board and in cooperation with the works managers correlating all production data, and investigating the possibilities of both present and future raw material. They will act as a consulting board in extending the present program of mill improvement and development.

Steel Furniture Orders Increased in July

WASHINGTON, Aug. 26.—Marking an increase of $243,414, orders for steel furniture in the "business group" amounted to $2,249,354 in July as against $2,005,940 in June, according to reports received by the Department of Commerce from 34 manufacturers. Unfilled orders increased $262,826 to $1,527,760 from $1,264,934, while shipments declined to $1,807,200 from $2,123,441. Orders in the first seven months of 1930 declined $3,025,249 to $16,973,238 from $19,998,487 in the corresponding period of last year and shipments dropped $2,978,897 to $16,866,729 from $19,845,626.

Orders in the "shelving group" in July decreased to $601,446 from $698,928, shipments were valued at $609,680, against $705,041, and unfilled orders were valued at $635,991, compared with $745,881.

In the first seven months of the current year, orders in this group aggregated $5,144,542, compared with $7,279,006 in the first seven months of 1929, and shipments were valued at $5,050,485, against $6,888,484.

12 Freyn Engineers Leave to Build Siberian Plant

Twelve steel mill engineers, comprising the second of several groups of engineers that Freyn Engineering Co., Chicago, is sending abroad in connection with its contract to design and build a complete steel plant at Kuznetsk, Siberia, have left the country.

This group, with their families, are: E. P. Everhard, E. H. Koenig, G. P. Wilson, C. A. Fox, Lewis Galloway, C. E. Maeder, C. B. Bower, A. L. Collette, J. A. Durfee, O. R. Rice, L. A. Wales, L. T. Youhn.

▲▲▲ PERSONALS ▲▲▲

Changes in Carnegie Steel Company

Lamont Hughes Succeeds President Clyde and Ambrose Diehl Becomes Steel Corporation Vice-President

I. LAMONT HUGHES, for the last two years vice-president of the United States Steel Corporation, with headquarters at New York, has been elected president of the Carnegie Steel Co., Pittsburgh. He succeeds WILLIAM G. CLYDE, who has tendered his resignation, effective Sept. 1, because of ill health. AMBROSE N. DIEHL, vice-president of the Carnegie company, has resigned to become a vice-president of the parent corporation, and RALPH H. WATSON, general superintendent of Carnegie's Homestead, Pa., steel works, has been named to succeed him in the Carnegie organization. SYDNEY DILLON, chief mechanical engineer of the company, has been named assistant to the vice-president, and R. A. HOLCOMB will continue as secretary to the president.

Mr. Clyde has been president of the Carnegie company since 1925. His career in the steel industry has been long and varied. He was born at Chester, Pa., and in 1888 was graduated from the Pennsylvania Military College. He began his career as a civil engineer with Ryan & McDonald, Baltimore, a steel construction firm, and later became associated with Robert Wetherill & Co., Chester, machinists and founders. He then went with the Wellman Steel & Iron Co., Thurlow, Pa., where he served as superintendent of the plate mill. His next move was to the South Works, Illinois Steel Co., Chicago, where he remained for six years. He left the Illinois company to become district sales manager at Philadelphia for the American Steel Hoop Co., where he remained until that company was absorbed by the Carnegie Steel Co. in 1900. After three years in the Cleveland sales office of the Carnegie company, Mr. Clyde was made assistant general manager of sales, with headquarters at Pittsburgh. In March, 1918, he was made vice-president and general manager of sales, in which position he served until his elevation to the presidency.

Mr. Hughes also has a long record of service with the Steel Corporation and its subsidiaries. Born in 1878 at Mercer, Pa., he attended public and high school at Mercer, New Castle and North Braddock, Pa. He entered the steel industry through the engineering department at Edgar Thomson works, Carnegie Steel Co., in September, 1897. In 1901 he was placed in charge of engineering for the Union Steel Co., Donora, Pa., and in 1905, he went to Youngstown as master mechanic of the bar mills of the Youngstown district plants of the Carnegie company, at that time including mills at Warren and Girard, Ohio, Greenville, Pa., and Upper and Lower Union works at Youngstown. He was made assistant general superintendent of the Youngstown district bar mills in 1906, and five years later succeeded to the general superintendency of these mills. In January, 1916, he was made assistant general superintendent of the entire Youngstown district for Carnegie, which at that time was constructing its new bar mills at McDonald, Ohio. Six months later he went to Ojibway, Ontario, as general superintendent in charge of the Canadian Steel Co.'s construction project at that point, but was transferred back to Pittsburgh two years later to assume charge of operations being carried on by the Steel Corporation on Neville Island in the construction of an ordnance plant. At the close of the war he was made president of the Lorain Steel Co., Johnstown, Pa., and on Jan. 1, 1920, became general superintendent of the Youngstown district for the Carnegie company. Mr. Hughes was made a vice-president of the company in January, 1925, and in April, 1928, he went to New York as vice-president of the Steel Corporation, in charge of operations and as assistant to James A. Farrell, president of the corporation.

Mr. Diehl, the new vice-president of the Steel Corporation, was born in York County, Pa., in 1876, and received his formal education at the York Collegiate Institute, York, Pa., and the Pennsylvania State College, having been graduated from the latter in 1898. He entered the steel industry through the laboratories at Duquesne works, Carnegie Steel Co., soon entering the blast furnace department at that plant. He became assistant blast furnace superintendent in 1900 and was given general charge of the department in 1901. In 1915 he became assistant general superintendent of Duquesne works and during the war period held the position of assistant operating vice-president with headquarters at the general offices in Pittsburgh. He was made general superintendent of Duquesne works in 1918, and vice-president of the company in January, 1925.

Mr. Watson joined the Carnegie Steel Co. in March, 1902, as a metallurgist's assistant at Homestead works. He successively became metallurgist, second assistant general superintendent, superintendent of open-hearth furnaces, assistant general superintendent and general superintendent, having been advanced to the latter position in April, 1928, to succeed John S. Oursler, who then became vice-president of the company. He was born in New Bruswick, Canada, in 1878, but later removed to

William G. Clyde

I. Lamont Hughes

Ambrose N. Diehl

Ralph H. Watson

Sydney Dillon

Massachusetts, where he was graduated from the Lawrence Scientific School of Harvard University. He gained his first experience with the steel industry at the Sparrows Point plant of the old Maryland Steel Co., where he served in the Bessemer department.

Mr. Dillon has been chief mechanical engineer of the Carnegie company since November, 1916. He went to work at the Edgar Thomson works of the then Carnegie Brothers & Co., Ltd., in 1899 and has served successively as blue print boy, tracer, draftsman and assistant chief engineer at Edgar Thomson works. He was born in Altoona, Pa., in 1877, and has attained his formal engineering training largely through private study and night technical classes.

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A. C. COOK, vice-president of the Warner & Swasey Co., Cleveland,

A. C. Cook

manufacturer of turret lathes, has resigned, effective Sept. 1. Mr. Cook has been with the company for 29 years. He was at one time manager of the New York sales offices; later general manager of sales, and represented the company for a few years in Europe. His plans for the future will be announced later.

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JAMES A. FARRELL, president, United States Steel Corporation, will sail on the Majestic Aug. 29 for Europe, where he will visit France and Germany. He plans to return early in October.

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F. J. O'BRIEN, president, Globe Steel Tubes Co., Milwaukee, is recovering from severe injuries received in an accident on Aug. 8.

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ERIC ZACHAU, Western sales manager for Manning, Maxwell & Moore, Inc., has resigned. He was identified with the company for 27 years. He was electrical engineer at the Shaw Crane works from 1903, when he arrived in this country, until 1915. He then spent five years at Pittsburgh as a sales engineer and in 1920 was made chief engineer. He was works manager for seven years and was made Western sales manager early in 1929.

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T. C. WEISER, of Boston, has been appointed superintendent of the Council Bluffs, Iowa, plant of the Griffin Wheel Co., succeeding F. J. HEAD, who has been transferred to the St. Paul, Minn., plant.

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E. G. HOWELL, vice-president of Erman-Howell Co., Chicago, dealer in scrap iron and steel, was critically injured on the night of Aug. 21 when the automobile which he was driving was struck by a Chicago, Milwaukee & North Shore train at the Skokie crossing west of Winnetka, Ill., where Mr. Howell makes his home.

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JAMES H. KENNEDY, assistant superintendent, Mystic Iron Works, effective Sept. 1, will be associated with L. J. Buck, Inc., New York. Mr. Kennedy has been with the Mystic Iron Works almost from the inception of the company, his first work being in connection with the construction of the Everett, Mass. plant.

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EDWARD P. SCALLON, for the past 10 years general superintendent of the Lake Superior iron mines for Clement K. Quinn & Co., has resigned his position to engage in private engineering practice. He joined the Quinn organization in 1919, coming from the position of general superintendent of the United Verde Extension, Jerome, Ariz.

—

A. W. REMENSNYDER, for 11 years treasurer of the Duquesne Steel Foundry Co., Coraopolis, Pa., has tendered his resignation effective Sept. 1, and on that date will become vice-president of the Hankey Baking Co., Pittsburgh. Before joining the Duquesne organization he was identified with the Republic Chemical Co., Pittsburgh.

New Steel Fabricating Plant for Pacific Coast

Consolidated Steel Corporation, 1200 North Main Street, Los Angeles, one of the leading steel fabricators on the Pacific Coast, has plans for initial units of new plant on 50-acre tract recently acquired at Slauson and Eastern Avenues, Maywood, consisting of main structural steel shop, 222 x 600 ft.; pontoon deck steel works, 135 x 475 ft.; template shop and uower house, 75 x 275 ft.; rivetmaking and maintenance shop, 75 x 200 ft.; forge and blacksmith shop, 65 x 75 ft., and smaller units, including office. Receiving and shipping yards will be equipped with 18 traveling cranes and other mechanical-handling equipment. Present works in Los Angeles will be removed to new location. Entire project will cost $1,000,000 with machinery. Waller Taylor is president.

Westinghouse Appoints Art Director

Incorporation of artistic beauty into industrial machinery is being undertaken in a systematic way by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. While the general form and appearance of smaller electric appliances has long been the subject of considerable attention on the part of manufacturers, the action of the Westinghouse company in applying aesthetic principles to larger units of equipment, which have heretofore been constructed purely from a utilitarian point of view, is considered something of an innovation.

In the development of this activity the company has engaged Donald R. Dohner, recently instructor in design in Carnegie Institute of Technology, Pittsburgh, as director of art. It will

Donald R. Dohner

be Mr. Dohner's task to work in conjunction with the engineering department in designing machines and equipment so that they will have grace and symmetry as well as mechanical perfection.

In discussing his new duties, Mr. Dohner stated: "In the past, engineering constructors have been interested in knowing that electrical machines are capable of accuracy, power and service. After these things were accomplished the designers paid scant attention to whether the structure was pleasing to the eye. A few faults were remedied by smoothing up rough edges and applying a shining coat of paint. It is our plan now to keep the idea of beauty and perfection of lines constantly in mind as the machine is being built up from blue prints. We hope in time to make every engineer, designer and workman 'appearance-conscious.' Instruction will be slow and painstaking but we hope that when the idea gains in practice it will make Westinghouse products stand out commandingly among those of competitors."

W. W. MACON
Editor

THE IRON AGE

A. I. FINDLEY
Editor Emeritus

ESTABLISHED 1855

What Is Buying Power?

AMONG the pernicious economic fallacies of the day one of the worst is this: Wages must not be reduced lest buying power also be reduced. A variant of this is the suggestion that employers should increase their number of workmen in order to abolish unemployment, relieve distress, and increase buying power.

The maintenance of a scale of wages for men who are unemployed and do not receive any wages manifestly does not preserve buying power. On the contrary it may impair it. Suppose there was a group of 100 carpenters enjoying a wage scale of $10 a day, or a total of $1,000, of whom 40 per cent fell into unemployment, reducing the income of the group to $600 per day. Suppose the whole group should reduce its scale to $8 per day and thereby obtain full employment; its income would be $800. Or suppose 60 men should retain the $10 scale and the other 40 go to work for $6; the group income would be $840. Either way there would be an increase of buying power, which would be further enhanced if the cost of living were concurrently reduced, as indeed it has been already.

Labor itself is not a commodity, but it becomes converted into commodities and it is subject to the same economic law of demand and supply that commodities obey. If a raw material becomes too costly, commerce looks for a substitute and generally finds it, or learns how to curtail the use of it, or manages somehow. If the labor component becomes too high, it is forced to machine manufacture. Even the work that carpenters used to do is now performed increasingly by machines in a mill, and there is growing consideration of machine-made houses in entirety. Labor is therefore responsible, innocently no doubt, for its own unemployment, but there is plenty of work to be done if it will become competitive.

The tightly bound building industry is evincing this. The first effect of unemployment in it was to sort mechanics into grades, the higher being retained, receiving scale wages but doing more toward earning them, while the lower were discarded. Sooner or later the lower are forced to go to work for what they can really earn. It may be reasonably expected that one of the broad effects of the deflationary readjustment of labor will be the breaking down of wage scales and a closer correlation with skill and earning capacity. The economic mischief of unionism has not been in its theory of collective action but rather in the practices of restricting the performance of work and of describing and allocating kinds of work, both of which result inevitably in economic waste and lead to unemployment in the end.

Buying power is the direct expression of earnings and earnings are the fruit of work. Wages that are paid for anything but earnings do not increase buying power. Great Britain has about 2,000,000 persons receiving doles but that does not increase its national buying power. Rather does it diminish it. The institution of public works may be a meritorious temporary expedient for ameliorating unemployment, but it comes out of the taxes that are paid by other people.

Machinery Exports an Exception

EXPORTS of machinery in the first half of this year made a remarkable showing. There was a gain over the first half of last year when practically all other exports decreased by an average of more than 20 per cent. Total exports of domestic merchandise decreased from $2,578,519,000 to $2,039,540,000, or by $538,979,000, 20.9 per cent. The increase in machinery exports, 2.8 per cent, occurred in face of what seemed to be irresistible pressure, so general were the decreases:

The Department of Commerce divides merchandise into eleven basic groups, and every one of these groups showed a decrease. One of the groups is "machinery and vehicles" and it ran quite true to form, showing indeed a decrease above the average, but that was because of a very large decrease in vehicles. All the iron and steel groups showed decreases. A succinct picture of what occurred is shown in the following table:

Exports First Half 1930, and Percentage Change From First Half 1929

	Value	Change
Iron and steel:		
Semi-manufactures	$42,459,000	—23.6
Manufactures	40,220,836	—20.0
Advanced manufactures	36,084,809	—21.8
Total	$118,764,645	—21.9
Machinery and vehicles:		
Machinery	313,464,486	+ 2.8
Automobiles, etc.	182,806,068	—46.1
Other vehicles	22,395,595	—19.6
Total	$518,666,149	—22.8

Everything was down about 20 per cent except that the automobile category, which includes buses, cars, trucks, parts for foreign assembly, parts for replacement, accessories and service equipment, was down more than twice as much, while machinery was up.

The different classes of machinery, moreover, held together rather well. Industrial machinery, by far the largest group, increased 3 per cent, agricultural machinery, the next group, increased 10 per cent, and electrical machinery, a close third, increased 5 per cent. Office appliances and printing and book bind-

ing machinery, relatively small items, decreased between 10 and 20 per cent.

The picture is a very remarkable one and it is impossible to refrain from moralizing. This machinery is something that the producers sell by enlightened and painstaking effort, while as to the remainder of our exports they are largely things the foreigners buy, when they can afford to do so. Buying power was reduced in general, and that is well exemplified by the large decrease in the automobile class, and an interesting point there is that automobile parts for replacement decreased almost as much as did parts for foreign assembly and complete units.

Large Fabricated Steel Tonnage

IT'S a pity an old idea does not hold good now, that activity in fabricated structural steel is a good index to trade generally, for if so business this year would be the best ever. The Department of Commerce reports, which are based on returns from 232 fabricating concerns, the remainder being pro-rated, show total shipments of fabricated structural steel in the first seven months of this year at 2,008,000 net tons, which is a new high record. It passes last year by only ½ per cent, but it is far above preceding years.

Indeed, this structural work used to be considered more than an index, for the contracting at least was considered more or less barometric. Contracting this year fell behind last year, but by only 17 per cent. Shipments fell short of bookings last year, while this year they have run somewhat ahead.

An interesting point is the unusual distribution of steel in this unusual year, and we have been led to do some computing. Defining terms precisely, it may be mentioned that the fabricating reports do not include ordinary plate work, in tanks, gas holders, oil refinery work, etc. As total finished rolled steel regularly runs 74 per cent of the ingot tonnage, we assume that shipments of fabricated structural steel represent 70 per cent of the ingot tonnage from which the steel originated. In the last four calendar years fabricated structural steel accounted for about 8 1/3 per cent, or just one-twelfth, of all the steel produced. Of course the construction work involved took more steel than that, as there was concrete reinforcement, machinery, elevators, etc. The total would probably be in the neighborhood of 10 per cent.

Using this 8 1/3 per cent factor to make a base, 100, fabricated structural steel shipments in the first seven months of five years have run as follows relative to total steel ingot production of the same period:

Shipments of Structural Steel Related to Ingot Output

1926	103
1927	90
1928	84
1929	90
1930	114

In three of the years the shipments apparently ran light, the reason being that ingot production in the forepart of a year runs above the year's average as a rule while that is not the case with structural steel This year the proportion of fabricated structural steel shipped to total ingots produced ran 24 per cent above the average proportion in the same period of the last four years.

This is not a reflection of the "easy money" we are being told so much about. If so, bookings would have run heavier this year than last, which is not the case. In large part the shipments were against projects planned and financed before the end of last year. At the same time it is to be noted that the pace of contracting has not been letting down lately. Bookings in the last three months have run above those in the first three months of the year by 9 per cent.

There is a reflection of the uneven distribution of steel this year that is observed in other directions. A striking point of course is that, while this structural steel work is running so heavy, consumption of steel in dwelling house and other small building work is running especially light. What may be called current consumption, involving steel used only temporarily, is off, but containers like steel barrels and tin cans have been doing better than one might expect.

Changes in the Favor of Fuels

CONSIDER the production of coal and its equivalents, the latter being petroleum, natural gas and hydroelectric power, each of which may be translated into the equivalent of tons of coal.

Anthracite is essentially a domestic fuel, although in a few places, the city of New York, for example, it is legally required for steam generation. During the last ten years the production and consequently the consumption of this commodity have been gradually decreasing, although population has been increasing. The reason is not hard to find. Bituminous coal has been substituted for steam generation in disregard of ordinances. Gas ranges supplied from central plants have been substituted for coal ranges in the homes. Suburban homes are more and more heated with petroleum. A recent innovation, that is proving eminently satisfactory, is the supply to country houses of bottled natural gas.

While bituminous coal has probably gained somewhat at the expense of anthracite, its own statistics do not look brilliant. Its production in the boom year of 1929 was only about the average of the last five years.

In examining the coal equivalent of fuel oil, natural gas, and hydroelectric power on the other hand we see a steadily increasing tendency in respect to each of them. In 1929 the coal equivalent of those things was more than 25 per cent of the total. In other words, a total coal production of 609,000,000 tons should have been 833,000,000 tons if coal had been the only article available.

It is easy to see the powerful effect that this has upon railroad transportation. Petroleum and natural gas are conveyed largely through pipes; electric current over wires. There is a similar correlation with the iron and steel industry, which is called upon to furnish line pipe instead of railroad locomotives, cars and track.

The substitution of one kind of transportation for another promises to go further. There is a strong tendency to pipe natural gas to great distances and an entirely new thought is the transportation of gasoline by pipe line instead of by tank car. An estimate, emanating from Kansas City, was recently published to the effect that a construction program for 6500 miles of main lines from the Southwest, running to $250,000,000, will presently be under way.

CORRESPONDENCE

Farm Mechanization a Primary Problem

To the Editor:—Please forward three copies of the Aug. 14 issue of THE IRON AGE. The leading article entitled, "Facing the Facts of Agriculture," is of special interest to us and we wish to make clippings of this article and forward it to persons who are not ordinary readers of this publication.

The mechanization of farming with the consequent dislocation of some 5,000,000 families throughout the entire country is perhaps the most important problem which this country faces. It is an involved problem. It cannot be escaped. Costs are reduced so greatly by large-scale mass production methods that competition if nothing else will force this great movement.

L. M. MARBLE,
President, Belmar Mfg. Co.

Canton, Pa.

Correct Design and Heat Treatment of Steel Dies for Die Castings

(*Concluded from page* 548)

not the case in the higher alloy steels. They are extremely sluggish and it is surprising how slowly their complex carbides go into solution. As an example, a recent test run on pieces 1 in. sq. and 2 in. long of No. 1 steel, chrome-vanadium type, were heat treated as follows:

> Each piece was given a 10-hr. soak at 1500, 1600 and 1700 deg. Fahr., and all were drawn at 950 deg. Fahr. The 1500 deg. Fahr. soak showed very poor solution of the carbides; the 1600 deg. Fahr. soak was considerably better, but the piece hardened at 1700 deg. Fahr. showed the most uniform microstructure.

If the carbides of such elements as chrome and tungsten are not in solution, the valuable properties of these compounds are being lost and perhaps a steel of real value is being condemned.

This solution problem can be handled in several ways. An extremely long-time soak at the proper temperature above the critical point, a high temperature soak for a shorter period, or perhaps a combination of the above two, i.e., a high temperature soak, then cooling in the furnace to the proper quenching temperature. In these higher alloy steels, the relative grain growth for prolonged soaking periods is practically negligible. The proper procedure in this matter is one of personal experience, especially when the warping and cracking possibilities of the die are considered.

Furnaces for Heat Treating

THE full type of furnace should be of such a size, in regard to the material to be heat treated, that there is no chance of flame or extremely hot gases impinging on the work. Furnace circulation should be such that all parts of the furnace are at the same temperature at all times. With three thermocouples (located such as one in the center of the roof, one in the front of one side wall and the third in the rear end of the other side wall) on a recording pyrometer an ideal furnace condition is afforded.

The automatically controlled electric or fuel furnace that depends on one couple, even if placed directly on the work, is not necessarily properly regulated, unless checked with several other couples, located in different corners or parts of the furnace and the heating units or flame flow so devised as to give an even temperature throughout. This is especially true when heat treating the larger die blocks. Hot and cold corners with a lagging center portion will cause warpage and possibly a cracked die. The rate of heating can also be controlled so as to help along the above lines.

Best Equipment Required

Heat treatment of die casting dies is an actual hardening operation requiring the best of equipment and facilities for proper handling. Dies are brought up to the proper hardening heat, soaked, quenched, and drawn to definite hardness figures, the main requirements being to return to the die shop one piece for every piece received in the shortest possible time, with the minimum of warpage, absolute freedom from scale, and a steel in a physical state to give maximum of toughness or high fatigue values, in the range of 400 to 444 Brinell hardness, wherein the die can be machined. There are always corrections to be made, changes added, casting department alterations in regard to gating, etc. The results desired are a finished die that will last as long as possible while pumping molten metal around 1200 to 1300 deg. Fahr. under 300 to 500 lb. pressure per sq. in., into its impression, at rates varying from possibly seven shots per minute to one every minute and a half, with cold circulating water running through the die in amounts necessary for production at a maximum rate.

Slags in Iron and Steel Metallurgy

DEVELOPMENT of the high-frequency induction furnace has made it possible to study, with comparative ease, new types of slags. For example, the metallurgical section of the Pittsburgh Experiment Station of the United States Bureau of Mines has investigated charges capable of producing ferromanganese where the slag composition is varied far from the limits of commercial operation.

Some of the results have indicated that much better operation may be obtained by using an entirely different type of slag from that ordinarily used in ferromanganese manufacture. It is to be hoped that some time in the future the operator will have data available which are not only trustworthy but which also will allow him to use quite different types of slags from those used in present-day operation without having to do experimental work on the tremendous scale necessary if a commercial furnace is used. Slag weights and slag compositions are very often the controlling factors in the production of quality material at low cost, and the efforts of the metallurgical laboratories should certainly be directed in some part to the development of types of slags other than those which are used at the present time simply because experience in practical operation has designated certain fields in which to work.

The Week in Business

Drift of Current Financial and Economic Opinion

A SUGGESTION that the "fall pick-up" in business may prove to be as great as usual is made by National Industrial Conference Board. "Sales of commercial electric service give evidence of strength in general trade. And the increase seems to show that consumer purchasing power is not so seriously impaired. . . . The low rate of unfilled orders leads to the hope of increased business activity in the near future."

Whether the recovery (now widely believed to be close at hand) is to be fast or slow is now, says *Business Week*, "chiefly a question of revival of individual initiative and aggressiveness. . . . Business may be slack, but business men are slacker."

Bond Prices Predict Early Gains

From that same source comes the statement that the steady rise in bond prices is a barometer foretelling an early improvement. "Past upturns in business activity, bond prices and stock prices have occurred in quick succession." And the present rise in bonds has continued "too long to be classed as a temporary 'bulge.'"

Less optimistic is the view of the Brookmire Economic Service, which believes there will be less seasonal improvement this fall than usual, though any further recession will be gradual and moderate. "Improvement," it concludes, however, "can be expected to set in around the first of 1931, and to be fairly pronounced by spring."

And, from the Guaranty Trust Co. of New York, "It still seems likely that September and October will bring the usual seasonal increase in some branches, but that genuine recovery of trade from the existing depression will be deferred for some months. . . . It appears that industry and trade are marking time, ready to respond to the first indication of reviving demand, but not yet convinced that higher levels of activity are warranted."

That "business almost never starts recovery in the off-season months" is the view of *Bankshares Review*, which continues: "Genuine recovery usually comes on the heels of seasonal expansion. . . . By late fall the current depression will have lasted longer than the average and the possibility of a return to normal conditions will be, therefore, considerably stronger."

Wages as a Crucial Point

Records of current factory employment and payrolls are viewed with alarm by *Annalist*, as "an indication of greatly diminished purchasing power. . . . That a point is drawing near at which there will be wider reductions of wage rates is pointedly suggested by current reports of corporation dividends reduced or passed."

An ameliorating condition, from the standpoint of the individual, is the further drop in the cost of living predicted by Alexander Hamilton Institute. Despite food and rent firmness, "the prospect is that the total cost of living will continue to decline during the coming twelve-month."

Taxation a Drag on Every One

A writer in New York *World* speaks of current taxation as the "greatest single burden of the taxpayer, absorbing six weeks' toil product of every wage earner's working year." He suggests that "it is quite time to consider how the burden may be lightened so far as possible, without crippling social service."

A European economist lays the whole blame for weakening prices to the growing scarcity of gold, and attributes the economic depression mainly to the lowering of the commodity price level. Disputing this theory are those who "see simply that worldwide overproduction is at the root of the present business depression. . . . Over-construction of manufacturing facilities has had a great deal to do with the over-activity which has developed in some lines."

2 Per Cent of Population Unemployed

Worst Conditions Were Found in Michigan, New Jersey and Rhode Island

UNEMPLOYMENT in the entire continental United States in April totaled 2,508,151 or 2 per cent of the total population of the United States, 122,698,190, according to preliminary returns of the Bureau of the Census. The number of unemployed includes those "without a job, able to work, and looking for a job." This group constitutes by far the major part of the total number of unemployed.

It was explained, however, that returns were made on the unemployment schedule for six other classes of persons not at work on the day preceding the enumeration. As soon as the tabulation can be completed, figures for the remaining classes will be published. These preliminary returns for the entire United States tally closely with percentages shown in an announcement on June 26, which covered a little less than one-fourth of the population.

Gainful Worker Figures Not Yet Known

The bureau said the percentages of unemployment shown by States are based on the total population rather than on the number of gainful workers, because the total population figures are now available and the gainful worker figures are not. Percentages based on the number of gainful workers will be made public as soon as the necessary information can be tabulated.

Meanwhile, said the bureau, it may be noted that the number of gainful workers is probably not far from 40 per cent of the total population of the United States. The ratio in 1920, it was added, was 39.4 per cent, varying as between States from 32 in North Dakota to 48.5 in Nevada.

Sharp Variations Between States

Percentages of unemployment given for the different States range from 0.5 per cent of the total population, in South Dakota and Mississippi, to 3.2 per cent in Rhode Island and New Jersey and 3.3 per cent in Michigan, the unemployment in the latter State being given as 160,506. New York State unemployment was given as 364,617, or 2.9 per cent; Illinois, 236,926, or 3.1 per cent; Pennsylvania, 211,877, or 2.2 per cent; Ohio, 168,277, or 2.5 per cent, and Massachusetts, 115,987, or 2.7 per cent.

Complete tabulation of the unemployment returns will include a classification by sex, age, color, etc., occupation and industry, the number of weeks each has been out of work and the reasons given for being out of work or for losing a job.

Iron and Steel Markets

Business Shows Slight Gain

Steel Ingot Output Up Another Point—Heavy Melting Scrap Advances in Three Major Markets—Tin Plate Shipments Spurt

BUSINESS in iron and steel has shown only a slight change for the better, but sentiment in the trade, though chastened by the protracted depression, is cautiously more hopeful. The passing of pessimism engendered by the drought, scattered evidences of greater interest on the part of steel buyers and additional advances in scrap prices are among the factors that are influencing current appraisals of the future. It is true that the industry, in its present conservative mood, can see little chance for a marked recovery in business this year, but there is growing adherence to the belief that the autumn months will at least bring some measure of seasonal improvement.

In view of the inconsequential change in actual mill bookings, no general upturn in steel plant operations is yet manifest, but gains exceed declines and average ingot output for the country at large has risen to 54 per cent, compared with 53 per cent last week and 52 per cent a fortnight ago.

The scrap market, although not an infallible index, is always given considerable weight as an augury, particularly when it shows sustained strength. Heavy melting steel has advanced on substantial mill purchases in the three most important buying centers. At Pittsburgh it went up 25c. a ton for the third time in as many weeks. At Chicago and Philadelphia advances of 50c. a ton are reported.

Furnace coke at Connellsville also is stronger, with some sellers now asking $2.65, compared with a recent maximum of $2.60.

Prices of finished steel have undergone further declines, although it is noteworthy that both buyers and sellers are beginning to think in terms of longer commitments. Some large consumers are attempting to close contracts for as long as a year ahead at present market quotations. Mills, on the other hand, are reluctant to obligate themselves beyond the end of the quarter, and at least one producer has notified customers that it will advance prices on bars, shapes and plates Sept. 15.

On tonnage for early shipment, concessions are still being made. Bars, except in small lots, have receded $1 a ton to 1.60c. a lb., Pittsburgh, again being on a common level with plates and shapes. Black sheets also are off $1 a ton to 2.40c. a lb., Pittsburgh, and 2.50c., Chicago district mill. Galvanized sheets are more commonly available at 3c., Pittsburgh, compared with a recent minimum of 3.05c. Long ternes are down $2 a ton to 3.45c. a lb., Pittsburgh, and common wire nails have declined to $2 a keg, a recession of $1 a ton.

Tin plate specifications, following more definite information on the extent of drought damage, have shown a spurt and shipments by the leading producer during the week were of record proportions. Large packs on the Pacific Coast will partly offset losses in canning crops elsewhere. Continued uncertainty regarding grain yields is apparently still holding back agricultural demand for wire goods, but steel releases by farm equipment makers have improved.

Road machinery manufacturers are also reported to be taking more steel, and business from the oil and gas industry is holding up. A Youngstown mill has booked 35,000 tons of electrically-welded pipe for a gas line from Kentucky to Indiana points, and prospective work indicates that the construction of a national pipe line network will prove a strong support to the steel industry for at least another year. Oil storage tanks pending in the Southwest call for a total of 10,000 tons of plates.

Building steel bookings, although hampered by the extreme conservatism of money lenders, remain in encouraging volume. Fabricated steel lettings, at 40,000 tons, equal those of the preceding week and are above average. Reinforcing bar awards, at 10,000 tons, are the largest since the middle of May.

Shipbuilders, who have been operating at a high rate for months, are figuring on four to six Grace Line vessels, calling for 20,000 to 30,000 tons of steel.

The extent of railroad buying this fall is problematical. Poor earnings have forced sharp economies and it is feared that both rail and rolling stock programs will suffer. Automobile consumption of steel shows only slight improvement. The Ford company continues to make 8000 cars a day, running four days a week, but the Chevrolet company is preparing to bring out new models. Suspensions of steel shipments preparatory to taking this step have already been felt by the mills, but early relief is expected with the placing of material for the new cars.

Iron and steel exports in July, at 131,772 tons, were the smallest for any month since February, 1925. More than three-quarters of the decline from June was in scrap, shipments of which were the lowest since February, 1927. Pig iron exports in July were the smallest in more than 30 years.

Machinery exports also declined, totaling $38,007,000 in July compared with $42,648,000 in the previous month and $56,826,000 in July, 1929. However, the seven months' total of $351,950,000 was within 3 per cent of the highest record ever attained for that part of the year.

THE IRON AGE composite price for finished steel has declined from 2.156c. to 2.142c. a lb., the lowest level since the first half of 1922. Pig iron is unchanged at $16.88 a gross ton.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Aug. 26, 1930	Aug. 19, 1930	July 29, 1930	Aug. 27, 1929
No. 2 fdy., Philadelphia	$19.76	$19.76	$19.76	$21.26
No. 2, Valley furnace	18.00	18.00	18.00	18.50
No. 2 Southern, Cin'ti	15.69	15.69	16.19	17.19
No. 2, Birmingham	14.00	14.00	14.00	14.50
No. 2 foundry, Chicago*	17.50	17.50	17.50	20.00
Basic, del'd eastern Pa.	18.75	18.75	18.75	19.75
Basic, Valley furnace	18.00	18.00	18.00	18.50
Valley Bessemer, del'd P'gh	20.26	20.26	20.26	20.76
Malleable, Chicago*	17.50	17.50	17.50	20.00
Malleable, Valley	18.50	18.50	18.50	19.00
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	94.00	94.00	94.00	105.00
Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	31.00	31.00	31.00	35.00
Sheet bars, Pittsburgh	31.00	31.00	31.00	35.00
Slabs, Pittsburgh	31.00	31.00	31.00	35.00
Forging billets, Pittsburgh	36.00	36.00	36.00	40.00
Wire rods, Pittsburgh	36.00	36.00	36.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.85
Finished Steel				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	*1.60*	1.65	1.65	1.95
Bars, Chicago	1.75	1.75	1.75	2.05
Bars, Cleveland	1.70	1.70	1.75	1.95
Bars, New York	*1.93*	1.98	1.98	2.29
Tank plates, Pittsburgh	1.60	1.60	1.65	1.95
Tank plates, Chicago	1.75	1.75	1.75	2.05
Tank plates, New York	1.88	1.88	1.93	2.22½
Structural shapes, Pittsburgh	1.60	1.60	1.65	1.95
Structural shapes, Chicago	1.75	1.75	1.75	2.05
Structural shapes, New York	*1.80½*	1.85½	1.85½	2.19½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.30
Hot-rolled strips, Pittsburgh	1.65	1.65	1.65	1.90
Cold-rolled strips, Pittsburgh	2.35	2.35	2.45	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel	Aug. 26, 1930	Aug. 19, 1930	July 29, 1930	Aug. 27, 1929
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	*2.40*	2.45	2.45	2.85
Sheets, black, No. 24, Chicago dist. mill	*2.50*	2.55	2.60	2.95
Sheets, galv., No. 24, P'gh	*3.00*	3.05	3.10	3.50
Sheets, galv., No. 24, Chicago dist. mill	3.15	3.15	3.25	3.60
Sheets, blue, No. 13, P'gh	2.05	2.05	2.15	2.35
Sheets, blue, No. 13, Chicago dist. mill	2.25	2.25	2.25	2.45
Wire nails, Pittsburgh	*2.00*	2.05	2.05	2.55
Wire nails, Chicago dist. mill	2.10	2.10	2.10	2.60
Plain wire, Pittsburgh	2.30	2.30	2.30	2.40
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.45
Barbed wire, galv., P'gh	2.80	2.80	2.80	3.20
Barbed wire, galv., Chicago dist. mill	2.85	2.85	2.85	3.30
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.35
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	**$15.50**	$15.25	$14.75	$19.00
Heavy melting steel, Phila.	**13.00**	12.50	12.50	16.50
Heavy melting steel, Ch'go	**12.50**	12.00	12.00	15.25
Carwheels, Chicago	13.50	13.50	13.50	14.00
Carwheels, Philadelphia	**15.00**	14.50	14.50	16.50
No. 1 cast, Pittsburgh	13.50	13.50	13.50	15.50
No. 1 cast, Philadelphia	13.00	13.00	13.00	16.50
No. 1 cast, Ch'go (net ton)	12.00	12.00	12.00	14.50
No. 1 RR. wrot., Phila.	15.00	15.00	15.00	16.00
No. 1 RR. wrot., Ch'go (net)	10.00	10.00	10.00	14.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.60	$2.60	$2.50	$2.65
Foundry coke, prompt	3.50	3.50	3.50	3.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	11.12½	11.12½	11.12½	18.12½
Electrolytic copper, refinery	*10.50*	10.75	10.75	17.75
Tin (Straits), New York	*29.50*	30.20	29.87½	46.12½
Zinc, East St. Louis	*4.30*	4.40	4.75	6.80
Zinc, New York	*4.65*	4.75	5.10	7.15
Lead, St. Louis	5.35	5.35	5.15	6.55
Lead, New York	5.50	5.50	5.25	6.75
Antimony (Asiatic), N. Y.	7.75	7.75	7.12½	9.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

PITTSBURGH

Steel Prices Weaker as Consumers Show More Interest—Scrap Higher

PITTSBURGH, Aug. 26.—Consumers of steel products are definitely showing increased interest in their future requirements, but are not yet disposed to make commitments on a large scale. Most of them seem to be looking for bargains and in some cases have offered to make contracts for as long as a year ahead at present market quotations. Mills generally are unwilling to commit themselves for more than the remainder of the quarter, although on a few attractive contracts shipments are to be made over the remainder of the year. On such business price concessions are being made and breaks in prices during the week have brought quotations on a number of steel products to new low levels.

Producers of steel obviously need tonnage badly, but their willingness to take business for immediate shipment at concessions from figures which they are unwilling to quote over comparatively long periods emphasizes their belief in a moderate recovery in tonnage as well as in prices before the end of the year.

Increased specifications are by no means general, but reports of slight improvement from a number of sources fortify the probability of better business in September. The industry has largely recovered from the unfavorable sentiment provoked earlier in the month by drought reports. The leading maker of tin plate has one of the best week's shipments in its history, and independent makers shared in varying degrees in releases which have followed several weeks of uncertainty among container manufacturers. As most of this tonnage had been anticipated, tin plate production is only a shade higher. Sheet mill operations have not yet crossed the 50 per cent level. Output of strip steel is also dragging bottom, but production of bars has been stepped up slightly as the result of limited increases in the requirements of cold finishers and heavier releases from a few automobile makers.

Steel ingot production has been stepped up a shade in the Valleys, but the average for the Pittsburgh district as a whole still stands between 50 and 55 per cent. A steel works blast furnace has been blown in at Pittsburgh.

Price weakness is most pronounced in products going principally to the automobile industry, although shading in discounts on pipe is reported from Oklahoma and reinforcing bars have suffered seriously from rail steel competition in the East. Nails are also being shaded from $1 to $2 a ton in some territories, even though quotations in the immediate Pittsburgh territory were beginning to achieve a semblance of stability. The recent 1.65c., Pittsburgh, price on bars now applies to little more than carload lots, while 1.60c. is being done on desirable business. This again brings bars to the same level as plates and shapes, a relationship which appar-

ently cannot be eliminated in this district. On galvanized sheets, 3c., Pittsburgh, is being offered to the trade as well as to jobbers with increasing frequency. Black sheets are also weaker in Detroit.

The scrap market has retained its recent strength and additional mill purchases in the last week have advanced heavy melting steel another 25c. a ton. This is the third advance of the same amount in as many weeks.

Pig Iron.—A few buyers are sounding out the market for prospective purchases, but actual buying is still confined to small lots for immediate shipment. On this sort of business the full quoted prices, as shown below, usually prevail, but even sellers admit that any substantial tonnages would bring out concessions. Shipments this month are running slightly lighter than in July.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$18.00
Bessemer	18.50
Gray forge	17.50
No. 2 foundry	18.00
No. 3 foundry	17.50
Malleable	18.50
Low phos., copper free	$26.66 to 27.06

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$18.50
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

Semi-Finished Steel.—Shipments so far this month have generally fallen behind those of July. Little or no buying of billets, slabs and sheet bars is reported, although there are occasional sales of forging billets. Wire rods are very quiet as the requirements of bolt and nut makers are light. Prices are nominally quoted on the same basis as last week.

Bars, Plates and Shapes. — The heavy hot-rolled products are moving in about the same volume this week as the month's average, with possibly a slight improvement in bars. Requirements of the cold-finishing mills have been a little heavier and demand for reinforcing steel has been well maintained. A dam at Safe Harbor, Pa., requiring 2000 tons of reinforcing bars, has just been let. Shipments of alloy and soft steel bars to the automobile and automobile parts makers have been improving slightly since the beginning of the month, but general demand for bar products scarcely justifies an operation of more than 55 per cent.

Heavy melting steel scrap 25c. a ton higher, the third advance of this amount in as many weeks.

* * *

Finished steel prices show pronounced weakness as interest of consumers in market increases.

* * *

Mills unwilling to contract beyond this quarter, however, at present low price levels.

* * *

Steel bars down to 1.60c. on desirable tonnage, in line with plates and shapes.

* * *

Reports of slight improvement in some quarters fortify belief in moderate September improvement.

Structural awards in the immediate Pittsburgh territory are still very light, but prospects for the fourth quarter are better. Plans for the West End-North Side bridge across the Ohio River are expected to be ready late in September. Steel fabricators are operating at about 40 per cent of capacity, with two or three larger shops doing considerably better. In some cases the possibilities of a profit are sacrificed in order to keep plants in operation, and fabricating quotations are generally low in comparison with the price of shapes. Plates are dull and growing even less active as railroad car builders reduce their requirements. Barge yards have also practically completed orders taken early in the year and the prospect of new business is not good. Two large companies are mentioned as possible purchasers of barges before the end of the year, but present inquiries generally call for single units only. A fair tonnage of plates is going into oil tankage and mills running on skelp are very busy.

On plates and shapes the price situation shows little change, with the market nominally quoted at 1.60c. to 1.65c., Pittsburgh. It is no secret that the lower figure is being shaded on large jobs in nearby territory, but seldom in the Pittsburgh district. Bars are weaker, suffering principally from their relation to plates and shapes, and the recent minimum of 1.65c., Pittsburgh, applies only on carload lots or less. On more desirable tonnage, 1.60c. is a more common quotation.

Bolts, Nuts and Rivets.—Depressed conditions in the building industry and the automotive trade and restricted buying on the part of the railroads continue to influence bolt and nut makers unfavorably, and operations do not average better than 45 per cent. Sales to jobbers are generally small in size, although rather numerous because of low inventories. Prices are well maintained at recent levels.

Rails and Track Supplies.—Practically no new inquiry has developed, but mills expect the railroads to show more interest in their future requirements after Labor Day. In the meantime, specifications are light, but operations have been fairly well sustained by heavier releases earlier in the month.

Tubular Goods.—The Central Public Service Corporation has placed an order for 35,000 tons of electric welded 15-in. pipe with the Youngstown Sheet & Tube Co. This material, which is for a 260-mile gas line extending from the Kentucky fields to Indiana points, will be the first to be produced on the company's new electric welding mill, now getting into production. Other line pipe projects continue active, but actual awards are still delayed. The United Gas Corporation is soon expected to close on about 100 miles of 6-in. tubing for a line in Texas and the projected West Virginia-Eastern Seaboard gas line of the Columbia Gas & Electric Corporation is prominent among pending

The Iron Age Composite Prices

Finished Steel

Aug. 26, 1930, 2.142c. a Lb.

One week ago	2.156c.
One month ago	2.171c.
One year ago	2.398c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High	Low
1930	2.362c., Jan. 7;	2.142c., Aug. 26
1929	2.413c., April 2;	2.362c., Oct. 29
1928	2.391c., Dec. 11;	2.314c., Jan. 3
1927	2.453c., Jan. 4;	2.293c., Oct. 25
1926	2.453c., Jan. 5;	2.403c., May 18
1925	2.560c., Jan. 6;	2.396c., Aug. 18

Pig Iron

Aug. 26, 1930, $16.88 a Gross Ton

One week ago	$16.88
One month ago	16.96
One year ago	18.25

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1930	$18.21, Jan. 7;	$16.88, Aug. 12
1929	18.71, May 14;	18.21, Dec. 17
1928	18.59, Nov. 27;	17.04, July 24
1927	19.71, Jan. 4;	17.54, Nov. 1
1926	21.54, Jan. 5;	19.46, July 13
1925	22.50, Jan. 13;	18.96, July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c. to 1.65c.
F.o.b Chicago	1.75c.
Del'd Philadelphia	1.94c.
Del'd New York	1.98c.
F.o.b. Cleveland	1.65c. to 1.70c.
F.o.b. Lackawanna	1.75c. to 1.85c.
F.o.b. Birmingham	1.85c. to 1.90c.
C.i.f. Pacific ports	2.25c.
F.o.b. San Francisco mills	2.25c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft.	1.70c. to 1.75c.
F.o.b. Birmingham, mill lengths	1.85c. to 1.90c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.65c.
F.o.b. Chicago Heights mill	1.65c.
Del'd Philadelphia	1.84c. to 1.89c.

Iron

Common iron, f.o.b. Chicago	1.75c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c. to 1.65c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c. to 1.90c.
Del'd Cleveland	1.78½c. to 1.83½c.
Del'd Philadelphia	1.80½c. to 1.85½c.
F.o.b. Coatesville	1.70c. to 1.75c.
F.o.b. Sparrows Point	1.70c. to 1.75c.
F.o.b. Lackawanna	1.70c. to 1.75c.
Del'd New York	1.88c. to 1.93c.
C.i.f. Pacific ports	2.15c. to 2.25c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c. to 1.65c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c. to 1.90c.
F.o.b. Lackawanna	1.75c. to 1.80c.
F.o.b. Bethlehem	1.65c. to 1.70c.
Del'd Cleveland	1.78½c. to 1.83½c.
Del'd Philadelphia	1.66c. to 1.76c.
Del'd New York	1.80½c. to 1.85½c.
C.i.f. Pacific ports	2.15c. to 2.25c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	1.75c.
Wider than 6 in., P'gh	1.65c.
6 in. and narrower, Chicago	1.85c. to 1.90c.
Wider than 6 in., Chicago	1.75c. to 1.80c.
Cooperage stock, P'gh	1.90c. to 2.00c.
Cooperage stock, Chicago	2.00c. to 2.10c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill	*2.45c. to 3.40c.
Strips, P'gh	2.35c. to 2.45c.
Strips, Cleveland	2.35c. to 2.45c.
Strips, del'd Chicago	2.63c. to 2.73c.
Strips, Worcester	2.60c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.70c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Merchant Trade

	Base per Keg
Standard wire nails	$2.00 to $2.10
Cement coated nails	2.00 to 2.10
Galvanized nails	4.00 to 4.10

	Base per Lb
Polished staples	2.50c. to 2.60c.
Galvanized staples	2.75c. to 2.90c.
Barbed wire, galvanized	2.70c. to 2.85c.
Annealed fence wire	2.30c. to 2.40c.
Galvanized wire, No. 9	2.75c. to 2.85c.
Woven wire fence (per net ton to retailers)	$65.00

To Manufacturing Trade

Bright hard wire, Nos. 6 to 9 gage	2.30c.
Spring wire	3.30c.

(Carload lots, f.o.b. Chicago)

Wire nails	$2.10 to $2.15 (keg)
Annealed fence wire	2.40c. to 2.50c. (lb.)
Bright hard wire to manufacturing trade	2.35c.

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Light Plates

	Base per Lb.
No. 10, blue annealed, f.o.b. P'gh	1.90c. to 2.00c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.10c.
No. 10, blue annealed, del'd Phila.	2.32c. to 2.42c.
No. 10, blue annealed, B'ham	2.15c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh	2.05c. to 2.15c.
No. 13, f.o.b. Chicago dist.	2.25c.
No. 13, del'd Philadelphia	2.44c.
No. 13, blue annealed, B'ham	2.30c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.35c. to 2.45c.
No. 24, f.o.b. Chicago dist. mill	2.50c. to 2.55c.
No. 24, del'd Philadelphia	2.74c. to 2.84c.
No. 24, f.o.b. Birmingham	2.70c.

Steel Furniture Sheets

No. 24, f.o.b. P'gh	3.60c. to 3.70c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.00c. to 3.10c.
No. 24, f.o.b. Chicago dist. mill	3.15c. to 3.20c.
No. 24, del'd Cleveland	3.28½c. to 3.33½c.
No. 24, del'd Philadelphia	3.29c. to 3.34c.
No. 24, f.o.b. Birmingham	3.25c. to 3.30c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.70c. to 2.80c.
No. 28, f.o.b. Chicago dist. mill	2.80c. to 2.90c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	3.60c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	3.45c. to 3.55c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.80c.

Tin Plate

Per Base Box

Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.30
15-lb. coating I.C.	12.90
20-lb. coating I.C.	14.00
25-lb. coating I.C.	$15.20
30-lb. coating I.C.	16.00
40-lb. coating I.C.	17.80

Alloy Steel Bars

(F.o.b. maker's mill.)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(1¼% Nickel)	$0.25
2100	(1¼% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

Per Gross Ton

Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	34.00
Light (from rail steel), f.o.b. mill	32.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

Base per 100 Lb.

Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plate, steel	2.07½
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18

Lap Weld

2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49⅛	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discount of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discount a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List

Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

projects. Seamless and lapweld mills in the district are still running practically full, and the new capacity in this and the Youngstown district for both seamless and electric welded pipe is gradually getting into production. Standard pipe is moving slightly better this month than last, but aggregate tonnage continues to lag 20 to 25 per cent behind that of last year. Shipments of mechanical tubing to the automobile industry are slightly heavier. Boiler tubes are quiet.

Wire Products.—Improvement in the wire business awaits the turn in general manufacturing activity, as little is expected from the merchant trade over the remainder of the year. Current specifications for bright hard and spring wire are sufficient to sustain a 50 per cent operating rate in local mills, and the price is well maintained on a basis of 2.30c., Pittsburgh. Nails are very quiet, but prices seem to be holding somewhat better. In this territory, at least, jobbers are unable to beat $2.05, Pittsburgh, while the price to the trade ranges from $2.10 to $2.15, depending upon size of order. Dating terms on wire fencing for the coming season will be announced in a few days.

Sheets. — Limited improvement in mill schedules here and there in the district give promise of higher operating rates next month, but sustained betterment is lacking. The average rate for the industry is still under 50 per cent of theoretical capacity, and some observers are inclined to discount this figure in view of the fact that production exceeded the so-called theoretical full by several points for an extended period in 1929. The automobile industry is accounting for most of the improvement reported in the last few weeks, but specifications from this all-important source are spotty, to say the least. Heavier releases are coming out from the various divisions of the Chrysler Corporation and this company is expected to increase its production next month. Reports last week of an anticipated decrease in output by the Ford Motor Co. have been vigorously denied. The requirements of the steel furniture makers are well sustained, but galvanized material going to the agricultural industry and the building trades has failed to pick up much. Steel drum makers are busy and shipments to radio manufacturers are increasing, if not at the rate anticipated earlier in the month.

Prices continue to reflect the usual desire of mills to get tonnage on their books at any cost and sustained pressure for concessions in the Detroit area has brought out figures on black and automobile body sheets which mills strenuously deny are representative of the market. Material moving on a black sheet base has been sold at 2.40c., Pittsburgh, and even at 2.35c., with the desirability of the extras involved as the excuse. On material involving no extras the market is said to be 2.45c. The market on galvanized sheets is openly 3c. to 3.10c., Pittsburgh, the lower figure applying occasionally to desirable orders from consumers as well as from jobbers. Light plates and blue annealed sheets are unchanged and continuous mills are finding little tonnage to quote on. Shading of extras on steel furniture sheets is quite common and considerable material is moving at a base price $2 a ton below the former minimum. Long ternes have declined $2 a ton, now being quotable at 3.45c. to 3.55c., Pittsburgh.

Tin Plate.—Last week's shipments of tin plate by the leading interest were as large as in any similar period in its history, and may have surpassed other records. A large part of this material is going to the Pacific Coast, where an exceptionally heavy tomato pack is contemplated to offset loss in the Eastern section affected by the drought. Other makers report somewhat heavier shipments. The sudden activity is generally believed to represent liquidation of demand, which had been held up until a fairly definite check on the drought damage could be obtained. As a considerable part of last week's tonnage had been anticipated by the mills, no sharp increase in operations was required, although some improvement on the part of independent makers brings the average for the industry to 60 to 65 per cent of capacity.

Strip Steel.—The situation in strip steel is not unlike that in the sheet industry, as both depend on automotive requirements for their ultimate prosperity. Specifications for strip are spotty and do not enable a consistent operating schedule. The industry as a whole may still be estimated as running at 35 to 40 per cent on hot-rolled material and 25 per cent on cold-rolled, with sharp variations from week to week even in individual plants. Prices are not too strong on hot-rolled material, as concessions of $1 a ton have been made in the Detroit territory. Cold-rolled strip is better established at 2.35c. to 2.45c., Pittsburgh or Cleveland.

Coal and Coke.—The market on furnace coke still reflects the strength imparted by restricted production, and some sellers are now asking $2.65, Connellsville, as compared with a recent maximum of $2.60. Lower figures have practically disappeared except occasionally on distress material or on foundry cullings, which ordinarily sell at a discount. Foundry coke shows little change and pressure of lower prices is not pronounced.

Old Material.—The scrap market has gained further strength in the last week because of further purchases of No. 1 heavy melting steel at $15.75 and $16. The latter figure is thought to have been paid at at least two points for fair-sized tonnages. Dealers are able to buy a little scrap at $15, although $15.25 is offered freely to cover recent orders. The mills which paid the highest prices ordinarily add a small premium; because of the select grade of scrap which they require and of high freight rates, $15.50 is a fair average price today, even though a $1 range is needed to represent the market broadly.

The market on hydraulic compressed sheets is very dull and, in the absence of mill buying, is quotable nominally at $15 to $15.50, the same as last week. Dealers could not sell Detroit material in this district on the basis of these figures, but little Michigan scrap is moving into the Pittsburgh territory at this time.

Warehouse Prices, f.o.b. Pittsburgh

	*Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.75c.
Reinforcing steel bars	2.75c.
Cold finished and screw stock—	
Rounds and hexagons	3.35c.
Squares and flats	3.85c.
Bands	3.10c.
Hoops	4.10c.
Black sheets (No. 24), 25 or more bundles	3.50c.
Galv. sheets (No. 24), 25 or more bundles	4.15c.
Light plates, blue annealed (No. 10), 1 to 24 plates	2.85c.
Blue annealed sheets (No. 13)	3.00c.
Galv. corrug. sheets (No. 28), per square	4.03c.
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 and 10 per cent off list
Machine bolts, 100 count,	60 and 10 per cent off list
Carriage bolts, 100 count,	60 and 10 per cent off list
Nuts, all styles, 100 count,	60 and 10 per cent off list
Large rivets, base per 100 lb.	$3.30
Wire, black, soft ann'l'd, base per 100 lb.	$2.60 to 2.70
Wire, galv. soft, base per 100 lb.	3.20 to 3.30
Common wire nails, per keg	2.45
Cement coated nails, per keg	2.65 to 2.80

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$15.00 to $16.00
No. 2 heavy melting steel	12.50 to 13.00
Scrap rails	15.00 to 15.50
Compressed sheet steel	15.00 to 15.50
Bundled sheets, sides and ends	13.00 to 14.00
Cast iron carwheels	15.00 to 15.50
Sheet bar crops, ordinary	15.50 to 16.00
Heavy breakable cast	11.50 to 12.00
No. 2 railroad wrought	15.00 to 16.00
Hvy. steel axle turnings	12.50 to 13.00
Machine shop turnings	8.00 to 8.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	17.50 to 18.00
Railr. coil and leaf springs	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
Low phos. billet and bloom ends	19.50 to 20.50
Low phos. mill plates	16.50 to 17.00
Low phos. light grades	16.50 to 17.00
Low phos. sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	12.50 to 13.00
Electric Furnace Grades:	
Low phos. punchings	17.00 to 17.50
Heavy steel axle turnings	12.50 to 13.00
Blast Furnace Grades:	
Short shoveling steel turnings	8.50 to 9.00
Short mixed borings and turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Rolling Mill Grades:	
Steel car axles	21.50 to 22.50
Cupola Grades:	
No. 1 cast	13.00 to 14.00
Rails 3 ft. and under	16.50 to 17.00

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$31.00
Rerolling, 4-in. and under 10-in., Youngstown	31.00
Rerolling, 4-in. and under 10-in., Cleveland	31.00
Rerolling, 4-in. and under 10-in., Chicago	32.00
Forging quality, Pittsburgh	36.00

Sheet Bars
(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

Slabs
(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

Skelp
(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Wire Rods
(Common soft, base)

	Per Gross Ton
Pittsburgh	$36.00
Cleveland	36.00
Chicago	37.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	11c.
Iron ore, basic Swedish, average 65% iron	9c.
Manganese ore, washed 52% manganese, from the Caucasus	26c. to 28c.
Manganese ore, Brazilian, African or Indian, basic 50%	26c. to 28c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $14.00
	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2 delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.60 to $2.65
Foundry, f.o.b. Connellsville prompt	$3.25 to 4.75
Foundry, by-products, Ch'go ovens	8.00
Foundry, by-products, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.35
Mine run coking coal, f.o.b. W. Pa. mines	1.40 to 1.50
Gas coal, ¾-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	.80 to .90
Gas slack, f.o.b. W. Pa. mines	.90 to 1.00

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$94.00 to $99.00
Foreign, 80%, Atlantic or Gulf port, duty paid	94.00 to 99.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $33.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	39.00

Bessemer Ferrosilicon
F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$26.50	13%	$32.50
11%	28.50	14%	34.50
12%	30.50	15%	37.00

Silvery Iron
F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$21.50	11%	$26.50
7%	22.00	12%	28.50
8%	22.50	13%	30.50
9%	23.50	14%	32.50
10%	24.50	15%	35.00

Delivered prices at Chicago are about 50c. a ton below this schedule.

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd	$1.30 to $1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to 18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works: High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	73
†Carriage bolts	73
Lag bolts	73
Plow bolts, Nos. 1, 2, 3 and 7 heads	73
Hot-pressed nuts, blank or tapped, square	73
Hot-pressed nuts, blank or tapped, hexagons	73
C.p.c. and t. square or hex. nuts, blank or tapped	73
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ¾ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	73
Semi-finished hexagon castellated nuts, S.A.E.	73
Stove bolts in packages, P'gh.	80, 10, 10 and 5
Stove bolts in packages, Chicago.	80, 10, 10 and 5
Stove bolts in packages, Cleveland.	80, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 5 and 2½
Stove bolts in bulk, Chicago.	80, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland.	80, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets
(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75
F.o.b. Chicago	2.85

Small Rivets
(7/8-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws
(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	*Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread,	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

CHICAGO

Further Moderate Rise in Steel Operations, Orders and Specifications—Pig Iron Shipments Gain

CHICAGO, Aug. 26.—Steel ingot production in the Middle West is experiencing a second consecutive week of moderate gains. The rate this week is close to 57 per cent of capacity. Sales of finished steel, including formal orders for recent rail purchases, were the largest in five weeks, and specifications topped by a small margin the volume entered a week ago.

Although the final quarter is near at hand and buying for that period might normally be expected soon, there is actually little indication that users are interested beyond immediate requirements.

As pointed out a week ago, business emanating from oil and gas-producing centers appears to be on the upswing. A new gas line has resulted in an order for 35,000 tons of pipe, and oil producers, having purchased several thousand tons of plates for tanks, are taking figures on an additional 10,000 tons. Tank shops throughout this territory and in the Southwest report backlogs of satisfactory proportions.

Wire business has held the gains in orders of a week ago, but the outlook is clouded. Sheets remain in light demand and prices are variable in a market subject to extreme competition. Quotations on mild steel bars are holding at 1.75c. a lb., Chicago, but occasional attractive business in plates and shapes is being taken at 1.70c. a lb., or $1 a ton under current quotations.

Such strength as can be detected in the local scrap iron and steel market seems to come almost wholly from limitation of supplies. Plate scrap is scarce and prices are firm. Freer supplies of cast iron borings are resulting in lower trading prices on this commodity.

Pig Iron.—Shipments of Northern foundry iron in August are passing by a fair margin the total delivered in July. Releases in the hands of sellers point the way to September shipments that will be heavier than the total going forward this month. Prices have settled to $17.50 a ton, f.o.b. local furnace, and boat iron, some of which still remains on docks at Chicago and Milwaukee, is being offered at $17. The Southern iron market is marking time so far as sales in this district are concerned. Prices lack strength at $12 a ton, Birmingham. Spot sales of charcoal iron in August are holding even with the volume booked in July, which so happens to have been one of the best months of the year. The silvery market is without feature.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charc'l, sil 1.50	27.04
S'th'n No. 2 fdy.	$18.01 to 18.51
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	27.29
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys. — Specifications for these commodities are spotty and continue small in the aggregate. New purchases are few and far between.

Coke.—Second half contracting is completed, and prices remain steady at $8 a ton, f.o.b. local ovens. Shipments in August will show a moderate gain over those of July, and the outlook for a further gain in September is promising. All ovens in this district are lighted and stocks are large in anticipation of the fall and winter heating season.

Bolts, Nuts and Rivets.—Output remains at 50 per cent of capacity, and current specifications are in such volume that improvement cannot be expected in the coming week. Fourth quarter contracts are being prepared at present quotations.

Plates.—Outstanding among purchases this week is 35,000 tons of 18-in. welded gas pipe ordered by the Central Public Service Corporation from the Youngstown Sheet & Tube Co. This line will gather gas in the Kentucky fields and distribute it to the Ohio River valley and southern Indiana. An oil refiner in the Southwest has ordered 2500 tons of tank plates, and inquiries of like character total 10,000 tons. Tank manufacturers report that orders on books are the largest in several months. Plate shipments from Chicago mills, bolstered by the demand for large diameter gas pipe, continue in steady and heavy volume.

Structural Material.—Inquiries and awards are light. On the other hand, mills find specifications against old orders at about the level of the past four or five weeks.

Bars.—Both in sales and specifications mild steel bars have made a moderate gain this week. Although some automobile and parts makers are finding slightly larger use for this commodity, the bulk of the increase has come from agricultural implement manufacturers and builders of road machinery. Deliveries range from two to three weeks except in cases where orders match with rolling schedules.

Demand for alloy steel bars shows no increase over the tonnage taken last week. Prices are steady. The iron bar market is dragging bottom in sales and specifications.

Local rail steel bar mills are operating on low but steady schedules. New purchases by agricultural implement manufacturers are spotty, but larger in the aggregate. Orders for fence posts made from old rails are beginning to climb from the low levels of mid-August.

Wire Products. — Although shipments of these commodities are holding to the gain made a week ago, little can be said of this market other than that it remains sluggish at a time when active demand is normally expected. Releases by the manufacturing trade are heavier than at the opening of the month, and it is believed by sellers that some further improvement can be expected in September. The character of orders indicates small and in some cases ragged stocks in the hands of users, a condition which should lead to heavier demand on short notice following any improvement in the general industrial situation. Jobbers give every indication that they are holding stocks to the minimum. Recent changes in copper ingot prices have made little impression on the copper wire market. The radio industry is buying very little magnet wire, while public utilities are buying electrical cables very close to immediate needs. Wire mill operations remain in the range of 40 to 45 per cent of capacity.

Cold-Rolled Strip.—Demand continues light and output has made no headway above the range of 25 to 30 per cent of capacity.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.90c.
Reinforc'g bars, billet steel—	
Less than 5 tons	2.85c.
5 tons to 30 tons	2.45c.
30 tons to 200 tons	2.00c.
200 tons and over	1.85c.
Rail steel reinforcement—	
Less than 5 tons	2.50c.
5 tons to 30 tons	2.10c.
30 tons and over	1.50c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.35c.
Flats and squares	3.85c.
Bands (⅞ in. in Nos. 10 and 12 gages)	3.10c.
Hoops (No. 14 gage and lighter)	3.65c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.60c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes (⅜ in. and larger)	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

	Per Cent Off List
Machine bolts	60 and 10
Carriage bolts	60 and 10
Coach or lag screws	60 and 10
Hot-pressed nuts, sq., tap. or blank	60 and 10
Hot-pressed nuts, hex., tap., or blank	60 and 10
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	$2.30 to 2.55
Cement c't'd nails, base per keg	2.30 to 2.55

Rails and Track Supplies.—The standard-section rail and track supply markets are at more or less of a standstill in an in-between season. The secondary buying movement did not develop, and this fact is leading to speculation as to the volume of purchases to be made this fall. It is recognized that most railroads are cutting expenditures as much as possible in view of poor earnings. The Northern Pacific usually makes commitments at this time for last half needs, but no inquiry has come out to date. The Great Northern is still withholding orders for 9000 tons for an extension. Most of the 3000 tons of rails ordered by the Chicago surface lines has been shipped. The Chicago elevated lines are starting moves for new financing, which will provide money for betterments and extensions to present lines.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.07½c. to 2.15c.; angle bars 2.75c.

Sheets.—The sheet situation is no more encouraging than it was a week ago. Orders reaching hot mills are small and scattered and prices lack stability. Sales in the week have established black sheets at 2.50c. to 2.55c. a lb., Chicago district mill, a reduction of $1 a ton in the week. Consumers find no interest in future needs, although the time is near at hand when inquiry should begin to develop for fourth quarter needs. Deliveries range from one to two weeks and some grades, such as roofing sheets, can be had from well rounded stocks. Jobbers are moving fair quantities of sheets, and their replacement orders to mills indicate that they are holding stocks within close limits.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.55c. to 2.60c.; No. 24 galv., 3.20c. to 3.25c.; No. 10 blue ann'l'd, 2.15c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Cast Iron Pipe.—Sellers report that a number of projects are receiving close attention on the part of municipalities and that the outlook for the second half of the year is quite favorable, as gaged by the tonnage moved in the first six months of 1930. At the moment the market is characterized by keen competition for going tonnages. At Toledo, 1500 tons of 16 to 24-in. pipe brought out a price of about $36 a ton, Birmingham. Fond-du-Lac, Wis., has placed 4600 ft. of 20-in. Class C pipe with the American Cast Iron Pipe Co. and Central Foundry Co. Fresh inquiries come from Joliet, Ill., for 5000 ft. of 6-in. and 5000 ft. of 8 and 12-in., and from Marquette, Iowa, for 8000 ft. of 4-in. and 2100 ft. of 6-in. pipe.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $44 to $46; 4-in., $47 to $49; Class A and gas pipe, $3 extra.

Warehouse Business. — Shipments show little change in recent days, and it is doubtful whether August deliveries will top those of July. Common wire nail prices are holding at $2.30 a keg in metropolitan Chicago and at $2.55 a keg in surrounding country districts.

Steel ingot output gains slightly to an average of 57 per cent of capacity.

* * *

Sales of finished steel, also contract specifications, are moderately larger than in preceding week.

* * *

Prices of finished steel are weaker, with black sheets at 2.50c. a lb. and plates and shapes occasionally shaded to 1.70c.

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Pig iron shipments gaining over those of July, with indications that September will bring further increase.

* * *

Moderate strength in steel scrap based largely on scarcity of good grades.

Reinforcing Bars.—Fresh inquiries are bringing substantial tonnages before the trade and the outlook is improved from several angles. In the first place the estimating bureau is well engaged. A gleam of light appears on the apartment construction situation in an award of over 300 tons this week and in a report that several very large projects of like kind are in the making. A public which is disinterested in real estate bonds is the largest obstacle which must be hurdled in the road to building construction recovery in the Chicago district. State and county highway and bridge construction remain high spots in this market. Lettings scheduled for the coming week call for about 1000 tons of reinforcing bars. Shop schedules have gradually receded throughout most of August.

Old Material.—A Chicago district mill has ordered 10,000 tons of heavy melting steel at $13 a gross ton, delivered. This marks the second advance in the price of this grade this month. Figuring freight rates as against the local switching charge would give an equivalent price delivered at Chicago of $12.75 a ton, but when taking into consideration the grade acceptable on this order the Chicago delivered quotation readily becomes $12.50 to $13. The Santa Fe has sold heavy melting steel at $10.55 a net ton on truck, which figures to $12.40 a gross ton, delivered. A sale of railroad cast has been made at 25c. a ton under the quotation of a week ago. Weakness is shown in borings, which dealers can buy at $6.75 a gross ton. Quotations on plate scrap are strong as a result of heavier demand. Brokers continue their efforts to eliminate short positions in several important grades.

Prices deliv'd Chicago district consumers:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$12.50 to $13.00
Shoveling steel	12.00 to 12.25
Frogs, switches and guards, cut apart, and misc. rails	13.00 to 13.50
Hydraul. compressed sheets	10.25 to 10.75
Drop forge flashings	8.50 to 9.00
No. 1 busheling	9.50 to 10.00
Forg'd cast and r'l'd steel carwheels	15.00 to 15.50
Railroad tires, charg. box size	15.50 to 16.00
Railroad leaf springs cut apart	15.50 to 16.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	13.50 to 14.00
Coil springs	16.00 to 16.50
Electric Furnace Grades:	
Axle turnings	11.25 to 11.75
Low phos. punchings	13.00 to 13.50
Low phos. plates, 12 in. and under	13.00 to 13.50
Blast Furnace Grades:	
Axle turnings	9.50 to 10.00
Cast iron borings	7.75 to 8.25
Short shoveling turnings	7.75 to 8.25
Machine shop turnings	6.00 to 6.50
Rolling Mill Grades:	
Iron rails	13.00 to 13.50
Rerolling rails	14.50 to 15.00
Cupola Grades:	
Steel rails, less than 3 ft.	13.75 to 14.25
Steel rails, less than 2 ft.	14.50 to 15.00
Angle bars, steel	13.25 to 13.75
Cast iron carwheels	13.50 to 14.00
Malleable Grades:	
Railroad	13.50 to 14.00
Agricultural	12.50 to 12.75
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	12.00 to 12.50
Iron arch bars and transoms	13.50 to 14.00
Iron car axles	21.50 to 22.00
Steel car axles	15.00 to 15.50
No. 1 railroad wrought	9.75 to 10.25
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	7.50 to 8.00
No. 2 busheling	6.00 to 6.50
Locomotive tires, smooth	14.50 to 15.00
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	12.00 to 12.50
No. 1 railroad cast	10.00 to 10.50
No. 1 agricultural cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Grate bars	8.50 to 9.00
Brake shoes	8.50 to 9.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Steel Scrap Is Stronger at Detroit

DETROIT, Aug. 26. — Open-hearth melting scrap has recorded advances during the past two weeks, while blast furnace scrap has declined.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$11.00 to $11.50
Borings and short turnings	6.00 to 6.50
Long turnings	5.75 to 6.25
No. 1 machinery cast	11.25 to 11.75
Automotive cast	13.50 to 14.00
Hydraul. comp. sheets	10.75 to 11.25
Stove plate	9.00 to 9.50
New No. 1 busheling	9.50 to 10.00
Old No. 1 busheling	8.75 to 9.25
Sheet clippings	8.00 to 8.50
Flashings	10.00 to 10.50

Michigan Steel Corporation has completed the erection of steel work for plant expansion at its mill at Ecorse, Mich. The steel construction involves a new bar storage building, roughing building, finishing building, warehouse and two pickler buildings.

NEW YORK

Steel Prices Continue to Give Ground—Pig Iron Sales Show Substantial Gain

NEW YORK, Aug. 26.—Pig iron sales, at 8500 tons, show a substantial gain over the total of 5000 tons reported for the previous week. Buying is characterized by better diversification and greater confidence, with some melters covering conservatively for the remainder of the year. However, there is still relatively little open inquiry and most sales are made only after careful canvassing of prospects. About 2500 tons is definitely before the trade for prices, including 500 tons for the Buffalo plant of the Worthington Pump & Machinery Corporation, which is still pending. Melt among foundries is spotty and the general average is probably little if any better than in recent weeks. Prices are still highly competitive, but have undergone no material change.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91
*Buff. No. 2, del'd east. N. J.	19.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	$18.89 to 19.39
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	18.89 to 19.89

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Finished Steel.—Signs of a definite upturn in steel business are still lacking. Bookings are spotty and on the average are holding at the rate of recent weeks, but there are no indications of an expansion in demand or a departure from the extreme caution that has characterized the policy of buyers throughout the year. The same spirit of caution is impeding the award of fabricated steel work. A total of 40,000 tons has been pending in this district for some time and 14,000 tons in fresh projects has come into the market in the past week, but difficulties in financing are delaying the letting of contracts. Money is plentiful but hard to get, since lenders are unusually conservative in granting requests for loans.

Prices on certain forms of finished steel continue to give ground under the pressure of sharp competition. On galvanized sheets 3c., Pittsburgh, is no longer limited to business from jobbers, but has been extended to apply on large orders from other classes of buyers. On the ordinary run of business, 3.05c. has become a common price. Black sheets are also weaker, with 2.40c., Pittsburgh, being done on relatively small tonnages. On wire nails $2.05 a keg, Pittsburgh, is the usual quoted price, but sellers are finding it increasingly necessary to dip to $2 to share in current business. Tank plates are unchanged at 1.70c., Coatesville, although it is conceded that attractive tonnages might bring out concessions. On structural shapes, 1.80½c. has become a general quotation.

Among the encouraging features is a pickup in tin plate specifications, following the passing of the drought scare. The tomato pack in this territory will be particularly large. However, tin plate specifications in this section for the year are likely to show a loss as compared with 1929. Merchant pipe demand in this market, reflecting New York building activity, has held up better than in other parts of the country, showing a decline of not much more than 5 per cent as compared with last year. Some local jobbers, in fact, have handled more pipe than in 1929.

Cast Iron Pipe.—Clifton Springs, N. Y., has awarded 377 tons of Class 150 water pipe to R. D. Wood & Co., and Oil City, Pa., has placed 3000 ft. of 10-in. water pipe with the United States Pipe & Foundry Co. There are few important public lettings, but there is a fair volume of small-lot business from both municipalities and private buyers.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $38.90 to $39.90; 4-in. and 5-in., $41.90 to $42.90; 3-in., $48.90 to $49.90. Class A and gas pipe, $3 extra.

Reinforcing Bars.—Few lettings of more than 100 tons are reported, but small-lot business is holding up well and several large new projects are coming up for bids. General contract bids for the New Jersey approaches to the Fort Lee bridge, 700 tons, will be taken next week. Tenders are being taken today on road work from Hackensack to Arcola, N. J., requiring 800 tons. Concrete bar bookings in this territory so far this year have been virtually on a par in terms of tonnage with lettings in the same period in 1929, but the dollar volume has declined because of price declines. Warehouse prices are easier, with as low as 2.30c. a lb., f.o.b. cars, New York, being done on warehouse lots. The market on warehouse steel now ranges from 2.30c. to 2.50c. on most business, although on very small lots as high as 3c. is being paid. Concrete bars in 40, 50 and 60-ft. lengths for mill shipment are quoted by distributers at 1.75c. to 1.85c. a lb., base Pittsburgh, with 1.70c. occasionally done on attractive tonnages.

Coke.—Some sellers of foundry coke report a slight gain in specifications, but this may mean nothing more than that certain melters allowed their stocks to drop too low. Prices on furnace coke are unchanged at $2.50 to $2.60 a net ton, Connellsville, while foundry coke prices are quoted as follows:

Special brands of beehive foundry coke, $4.85 a net ton, ovens, or $8.56 delivered to northern New Jersey, Jersey City and Newark, and $9.44 to New York and Brooklyn; by-product foundry coke, $9 to $9.40, Newark or Jersey City; $10.06, New York or Brooklyn.

Old Material.—Strength in heavy melting steel at Pittsburgh and a slightly firmer tone at Philadelphia have imparted some life to the New York market. In grades other than melting steel, however, there is very little activity. Brokers are offering $12.50, delivered Coatesville, Pa., for No. 1 steel. For shipment to Buffalo by barge, this week's offerings are $10.25 to $10.50, on barge, for No. 1 heavy melting steel and $7 to $7.25 for No. 2 steel. Heavy breakable cast is being shipped to a steel mill and a pipe foundry in the eastern Pennsylvania district at a spread of $1 a ton.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$9.00 to $10.50
Heavy melting steel (yard)	5.75 to 6.25
No. 1 hvy. breakable cast	8.00 to 9.00
Stove plate (steel works)	6.00 to 6.25
Locomotive grate bars	6.00 to 6.50
Machine shop turnings	5.00 to 5.25
Short shoveling turnings	5.00 to 5.50
Cast borings (blast fur. or steel works)	4.50 to 5.00
Mixed borings and turnings	4.50 to 5.00
Steel car axles	17.00
Iron car axles	19.00 to 19.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)	7.50 to 8.00
Forge fire	7.50
No. 1 railroad wrought	9.75
No. 1 yard wrought, long	8.75
Rails for rolling	9.50 to 10.00
Stove plate (foundry)	7.00
Malleable cast (railroad)	10.50 to 11.00
Cast borings (chemical)	8.50 to 9.00

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	$14.00
No. 1 hvy. cast (columns, bldg. materials, etc.); cupola size	12.00
No. 2 cast (radiators, cast boilers, etc.)	11.50

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars, small shapes	3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin, shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Blue ann'l'd sheets (No. 10)	3.25c. to 3.40c.
Black sheets (No. 24*)	3.65c. to 3.90c.
Galvanized sheets (No. 24*)	4.25c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	65
1 x 30 in. and smaller	65
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65
¾ x 20 in. and smaller	65
Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

PHILADELPHIA

Advance on Bars, Shapes and Plates on Sept. 15 Forecast by Steel Company

PHILADELPHIA, Aug. 26.—Steel and pig iron business has not yet given signs of the improvement that is expected to develop in September. While better sentiment prevails, it is based on hope rather than on tangible developments of a favorable character. Beyond the fact that orders are coming from more diversified sources, without, however, showing any gain in aggregate tonnage, the situation follows the pattern of the past several weeks. Operations are unchanged. The Bethlehem Steel Corporation is on a 60 per cent of capacity basis, and other plants in the East are not doing better than 50 per cent.

One large steel producer has informed its customers that prices on bars, shapes and plates will be advanced Sept. 15, but doesn't say how much. It is considered possible that a "paper" advance or an actual improvement in general business might induce buyers to make fourth quarter contracts, provided mills are willing to cover them for that period at the prevailing low prices. Some mills are considering carefully whether they would care to protect buyers very far in advance at the present unprofitable price level.

Pig Iron.—Aside from the fact that a few foundries are taking shipments a little more freely, no favorable trend has developed in pig iron trade. Foundry operations, on the whole, are still at a very low rate. Pig iron prices, which are nominally $18.50 to $19 a ton, eastern Pennsylvania furnace, are receiving their chief test from the competition of Southern iron rather than from efforts of melters to obtain lower prices. As there are few foundries willing to take the amount of iron necessary to obtain the most favorable prices quoted by Southern producers, this competition has not proved serious.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$19.26 to $19.76
East Pa. No. 2X, 2.25 to 2.75 sil.	19.76 to 20.26
East Pa. No. 1X	20.26 to 20.76
Basic (del'd east. Pa.)	18.25 to 18.50
Malleable	21.25
Stand. low phos. (f.o.b. east. Pa. furnace)	24.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Plates.—Shipbuilders are bidding on ships for the Grace Line. Either four or six may be ordered, each to take about 5000 tons of steel, mostly plates. In no other branch of plate consumption is the outlook particularly favorable. Eastern mills continue operations at about 50 per cent, this rate having been fairly steady during all of this month. One mill which was shut down last week resumed operations Monday morning. On desirable tonnage, 1.70c., Coatesville, is occasionally shaded, but this price obtains on ordinary tonnage, with 1.75c. asked for small lots.

Structural Material.—The outlook for larger bookings of fabricated structural steel next month appears to be fairly promising. A number of projects on which bids have been taken are expected to reach the closing stage. Bids will be closed next week on Market Street improvements, which call for 4000 tons of shapes, 2000 tons of sheet steel piling, in addition to 2000 to 3000 tons of bars. Prices are unchanged at 1.60c. to 1.65c., f.o.b. nearby mill.

Steel Bars—Quotations on merchant steel bars remain steady at 1.65c., Pittsburgh, or 1.94c., delivered Philadelphia. Orders are mostly for small lots for prompt shipment. Bids will be taken up to Sept. 5 on 1000 tons for the Market Street subway. Billet steel reinforcing bars are quoted by distributers at 1.75c. to 1.85c., Pittsburgh, for mill shipment, and rail steel bar prices range from 1.55c. to 1.60c., Franklin, Pa.

Wire Nails.—Although some mills are still quoting $2.05 a keg, base, Pittsburgh, for wire nails, competition results in frequent sales to both jobbers and consumers at $2.

Sheets.—There is no indication of a broadening in the demand for sheets, and competition remains keen for the small volume of going business, with price concessions frequent. Blue annealed sheets range from 1.90c. to 2c., Pittsburgh, for No. 10 gage and from 2.05c. to 2.15c. for No. 13 gage, but the higher prices are being obtained less frequently than a few weeks ago. Galvanized sheets range from 3c. to 3.10c., Pittsburgh, with the bulk of the orders being taken at 3c. and 3.05c. There are occasional concessions from 2.45c., Pittsburgh, on black sheets.

Imports.—The week's arrivals at Philadelphia included 2720 tons of chrome ore, of which 2000 tons came from Portuguese Africa and the remainder from Greece; 6700 tons of iron ore from Algeria and 50 tons from the United Kingdom; 1803 tons of pig iron from India, 20 tons of hoop steel from England, 15 tons of structural shapes from France and 17 tons from Germany.

Old Material.—It develops that an eastern Pennsylvania mill recently contracted for about 20,000 tons of heavy melting steel with two brokers, paying $13 for a large part of the tonnage and $12.50 for the remainder. The broker with the higher priced order is freely offering $12.50 to dealers for shipment on its contract, which has forced the other broker to pay the same amount, so that his order leaves no profit. This situation, together with the fact that the Pittsburgh market is stronger, and that the eastern Pennsylvania market must advance at least $1 a ton to compete with Pittsburgh mills for New England scrap, has given a good deal of strength to the steel scrap market in the East. Brokers would not take orders at less than $13 today, and some prefer making no commitments until next month, when it may be apparent whether steel operations are to be increased. In view of the present situation, No. 1 heavy melting steel can fairly be quoted at a flat price of $13 this week.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.00
No. 2 heavy melting steel	$10.00 to 10.50
Heavy melting steel (yard)	10.00
No. 1 railroad wrought	14.75 to 15.00
Bundled sheets (for steel works)	9.50
Hydraulic compressed, new	11.00 to 11.50
Hydraulic compressed, old	9.50
Machine shop turnings (for steel works)	9.00
Heavy axle turnings (or equiv.)	11.50 to 12.00
Cast borings (for steel works and roll. mill)	8.75 to 9.00
Heavy breakable cast (for steel works)	11.50 to 12.50
Railroad grate bars	10.00
Stove plate (for steel works)	10.00
No. 1 low phos., hvy., 0.04% and under	20.00
Couplers and knuckles	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
No. 1 blast f'nace scrap	8.00 to 8.50
Wrot. iron and soft steel pipes and tubes (new specific.)	12.00 to 12.50
Shafting	18.00 to 18.50
Steel axles	21.00 to 21.50
No. 1 forge fire	11.50 to 12.00
Cast iron carwheels	15.00
No. 1 cast	13.00 to 13.50
Cast borings (for chem. plant)	14.00 to 14.50
Steel rails for rolling	13.50 to 14.00

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.60c.
Structural shapes	2.60c.
Soft steel bars, small shapes, iron bars (except bands)	2.70c.
Reinforc. steel bars, sq., twisted and deform	2.60c. to 2.70c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.25c.
Steel bands, No. 12 to ¼-in. inclus.	3.00c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.70c.
†Galvanized sheets (No. 24)	4.25c.
Light plates, blue annealed (No. 10)	3.15c.
Blue ann'l'd sheets (No. 13)	3.30c.
Diam. pat. floor plates, ¼-in.	5.30c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

CLEVELAND

Moderate Gain in Business Expected in September—Ingot Output Lower

CLEVELAND, Aug. 26.—Sentiment has improved in the steel industry and a moderate gain in business is looked for during September. With a light volume of orders, steel business showed no evidences of expansion during the past week. Some of the mills making the heavier rolled products report quite a gain in the tonnage entered this month over the corresponding period of July, but the improvement is confined to structural shapes.

Operations of metal-working plants in most lines are still greatly reduced and signs of an improvement are lacking. Demand for steel from the automotive industry will be expanded shortly by purchases of material for the new models of Chevrolet cars. Suspension of shipments of sheets and other material for this company's automobiles, while production was being wound up on the old models, has been severely felt by some of the Ohio mills. The Chevrolet Motor Co. placed new orders for stampings with some of the local stamping plants during the week and the Cleveland plant that manufactures bodies for this company's cars shortly will place a considerable tonnage of sheets.

Steel plant operations in Cleveland were further curtailed this week by the shutting down of five open-hearth furnaces, reducing the rate of operation to 26 per cent of ingot capacity. This sharp decrease was, for the most part, due to the shutting down of its steel plant by one producer that has been operating four open-hearths. This company plans to resume operations in about 10 days, when it uses up the stock of semi-finished steel which it has accumulated. The Otis Steel Co. this week blew out a blast furnace for relining.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$18.00
S'th'n fdy., sil. 1.75 to 2.25	$18.51 to 19.51
Malleable	18.00
Ohio silvery, 8 per cent	25.50
Basic Valley furnace	18.50
Stand. low phos., Valley	26.50 to 27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates; 50c. average local switching charge; $3 from Jackson, Ohio; $6.01 from Birmingham.

Pig Iron.—Sales declined considerably the past week, notwithstanding the light volume of business that has prevailed recently. Most consumers have covered for their early needs, beyond which they are not inclined to make commitments at present. Speculative buying has been light. Increase in shipping orders by some of the furnaces this month is attributed to a slight gain in orders by the automotive and some other consuming industries. Business with the jobbing foundries continues very slow. Not much inquiry is pending, although a Toledo foundry and another northern Ohio consumer are each in the market for 1500 tons of foundry iron for the remainder of the year.

There is little change in the price situation. Competition is keen for business at competitive points. Lake furnaces quote foundry and malleable iron at $16.75 to $17, the lower price having become more common for delivery in northern Ohio. In northern Indiana, $17 is being well maintained and $18 prevails in Michigan. For Cleveland delivery, local furnaces are holding to $18.

Bars, Plates and Shapes.—Demand for steel bars continues very light. Orders are confined to small lots for immediate needs. There is little call for plates from any consuming industry. Recent orders for fabricated work have kept up the demand for structural shapes, which is fair. Little new building work is pending and local shops need business. The only sizable job that is being figured on is the State office building at Columbus, requiring 4000 tons. Bids have been taken on the general contract.

Bars are quoted at 1.65c., Cleveland, for outside shipment and at 1.70c. for local delivery. On plates, 1.60c., Pittsburgh, has become quite common. On structural shapes there is a spread of from 1.60c. to 1.65c., Pittsburgh, the lower price having become more general.

Semi-Finished Steel.—Specifications for sheet bars, billets and slabs continue light, and a local producer is now operating only four open-hearth furnaces. No concession is reported from the $31 price.

Wire Products.—Orders are still scarce and prices are unchanged. Nails are quoted at $2.05, Cleveland, to jobbers. Manufacturers' wire appears firm at 2.30c.

Reinforcing Bars.—The Brecksville Road bridge, calling for 750 tons, brought out sharp competition between makers of billet steel and rail steel bars. The job went to a Youngstown fabricator. Inquiry includes 200 tons for the Higbee department store and several lots of less than 100 tons.

Bolts, Nuts and Rivets.—Bolt and nut makers report a slight gain in orders from the automotive industry. Prices are well maintained. The industry is operating at about 40 per cent of capacity. Rivet orders are also slightly better. Prices are firm.

Sheets.—With orders light from all consuming industries, the demand shows no improvement. Tonnage from the automotive industry seems as light at present as at any time during the year. However, a local General Motors unit is expected to come in the market late in the week for approximately 15,000 tons for about 100,000 bodies for new model Chevrolet cars. Old orders have been cleaned up and some changes have been made in body design, necessitating changes in the Chevrolet sheet specifications.

The market has a weak tone owing to the anxiety of some mills for business. This is particularly true of black sheets, on which quotations of 2.35c., Pittsburgh, have appeared, although 2.45c. is still the recognized price. Reports that 3.60c. has been shaded on auto body sheets are unconfirmed. There has not been enough business in this grade recently to furnish a price test. Galvanized sheets are unchanged at 3c. to 3.10c.

Strip Steel.—While one hot strip mill has been benefited by a slight gain in orders from the automotive industry, the aggregate volume of business continues light. Wide strip is unchanged at 1.65c., Pittsburgh. On narrow material a 1.75c. price is being generally maintained, although some business has been taken at 1.70c. Orders for cold-rolled strip are very scarce. This is quoted at 2.35c. to 2.45c., Cleveland, with the lower price more common.

Old Material.—No consumer demand has developed and little scrap is moving, as the leading local buyer still has in effect its orders to accept no shipments. There is some demand from dealers for scrap to ship against contracts with Youngstown district mills. Dealers are paying $14.50 for heavy melting steel and $14.25 for compressed sheet steel to fill these orders.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$11.75 to $12.25
No. 2 heavy melting steel	11.25 to 11.50
Compressed sheet steel	12.25 to 12.50
Light bundled sheet stampings	11.00 to 11.50
Drop forge flashings	10.00 to 10.50
Machine shop turnings	8.00 to 8.50
Short shoveling turnings	9.75 to 10.25
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	14.00 to 14.50
No. 1 busheling	11.75 to 12.00
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades:	
Low phos., forging crops	17.75 to 18.00
Low phos., billet bloom and slab crops	18.50 to 18.75
Low phos., sheet bar crops	18.00 to 18.50
Low phos., plate scrap	18.00 to 18.50
Blast Furnace Grades:	
Cast iron borings	9.00 to 9.25
Mixed borings and short turnings	9.00 to 9.25
No. 2 busheling	8.75 to 9.00
Cupola Grades:	
No. 1 cast	15.00 to 15.50
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	18.50 to 19.50
Miscellaneous:	
Rails for rolling	16.25 to 16.50
Railroad malleable	16.00 to 16.50

CANADA

Improvement Discerned but Confined Mainly to Small Tonnage Business

TORONTO, Aug. 26.—Some improvement developed in merchant pig iron sales in the Canadian market during the past week. New business, however, is still strictly confined to small tonnage spot lots. Shipments of iron are down more than 50 per cent from those of a year ago. Local blast furnace representatives look for a limited amount of contract buying about the middle of September. The Canadian industry is depending largely on improvement in the western grain situation and the railroads to relieve the present depression in steel. Imports are holding at a minimum. Canadian iron prices remain unchanged.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	22.50
Imported Iron, Montreal Warehouse	
Summerlee	$33.50
Carron	33.00

Structural Steel.—During the past week or two some improvement has featured business in fabricated steel.

While some fair tonnages were booked in the eastern part of Canada, the demand for steel on the western coast is still well to the front in the matter of tonnage and fabrication activities. Inquiries before the trade at present are mostly for small tonnages, although a few fair-sized lots are included in the list. Between 6000 and 7000 tons will be required for the Burrard Street bridge at Vancouver, for which bids are being received until Oct. 31, by William McQueen, city clerk. The Beauharnois Power Corporation, Montreal, placed orders for 11,000 tons of steel in connection with power development project.

Old Material.—Consumers are coming into the market only when urgently in need of supplies for immediate consumption and are holding orders to small tonnage. Mills are taking in supplies against old contracts and are placing small spot orders for heavy melting steel and turnings. Much of the buying is from the Hamilton district. In Montreal, business is at a standstill. Foundry and other users of iron scrap are showing little interest. Dealers in turn are out of the market for supplies except when special lots are required for direct shipment to consumers. Price lists strike a good average of what is being paid for supplies and are unchanged for the week.

Dealers' buying prices for old material:

Per Gross Ton	Toronto	Montreal
Heavy melting steel	$9.00	$8.00
Rails, scrap	10.00	8.00
No. 1 wrought	9.00	11.00
Machine shop turnings	6.00	5.00
Boiler plate	7.00	6.50
Heavy axle turnings	7.00	6.00
Cast borings	6.50	5.00
Steel borings	6.50	6.00
Wrought pipe	4.00	4.00
Steel axles	10.00	13.00
Axles, wrought iron	12.00	15.00
No. 1 machinery cast	....	12.00
Stove plate	....	10.00
Standard carwheels	....	10.50
Malleable	....	10.00
Per Net Ton		
No. 1 mach'ry cast	11.00	....
Stove plate	9.00	....
Standard carwheels	10.00	....
Malleable scrap	9.00	....

ST. LOUIS

Slightly Better Tone in Pig Iron—Scrap Shade Firmer—Finished Steel Quiet

ST. LOUIS, Aug. 26.—Purchasing of pig iron continues in small lots for prompt shipment mainly, but some scattered inquiry has developed, and the tone of the market generally is better. Shipments so far this month have been in larger volume than during the same period in July, though well below a year ago. Gradual increase in the melt at foundries is noted, stove plants making a particularly favorable showing. Approximately 2200 tons of foundry and malleable grades changed hands the past several days. A diversity of interests was represented in the buying. Prices remain unchanged, with fewer reports of shading than has been the case in some time.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$18.00 to $18.50
Malleable, f.o.b. Granite City	18.00 to 18.50
N'th'n No. 2 fdy., deliv'd St. Louis	19.66
Southern No. 2 fdy., deliv'd	16.42
Northern malleable, deliv'd	19.66
Northern basic, deliv'd	19.66

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Steel. — Fabricators of structural material report some small orders and fair prospects for September. A fair tonnage of reinforcing concrete bars is moving in small lots to highway construction and municipal and river improvement work. Warehouse activities are holding their own, and are somewhat greater than at the same time last month. Foundries report some improvement in shipping directions of completed castings, particularly from the automotive industry.

Old Material.—The firming tendency in iron and steel scrap, noted earlier in the month, has continued. Dealers are firm in their views, and are unwilling to deal on the terms currently offered by the mills and other industries. Melters, on the other hand, are endeavoring to push down prices, and the result is a temporary deadlock. Only absolutely necessary tonnages are being bought, and for these buyers are obliged to meet dealers' terms. The railroads are receiving stiff prices for all they have to market. There is no surplus waste material in this market, and offerings are decreasing rather than augmenting. Practically nothing is coming in from country shipping points, and very little is being originated by the industries. Railroad offerings have decreased, the only list before the trade being 35 car loads by the Nickel Plate Railroad.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	$11.50 to $12.00
No. 1 heavy melting or shoveling steel	11.00 to 11.50
No. 2 heavy melting or shoveling steel	10.00 to 10.25
No. 1 locomotive tires	13.00 to 13.50
Misc. stand-sec. rails including frogs, switches and guards, cut apart	11.50 to 12.00
Railroad springs	14.00 to 14.50
Bundled sheets	6.50 to 7.00
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.00 to 9.50
Cast iron borings and shoveling turnings	9.25 to 9.50
Iron rails	10.00 to 11.00
Rails for rolling	12.50 to 13.00
Machine shop turnings	6.75 to 7.25
Heavy turnings	9.25 to 9.75
Steel car axles	16.00 to 16.50
Iron car axles	21.50 to 22.00
Wrot. iron bars and trans.	14.00 to 14.50
No. 1 railroad wrought	9.00 to 9.50
Steel rails, less than 3 ft.	14.00 to 14.50
Steel angle bars	11.25 to 11.75
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	11.50 to 12.00
Railroad malleable	10.50 to 11.00
No. 1 railroad cast	11.00 to 11.50
Stove plate	9.00 to 9.50
Relay, rails, 60 lb. and under	20.50 to 23.50
Relay, rails, 70 lb. and over	26.50 to 29.00
Agricult. malleable	10.00 to 10.50

Philadelphia Fabricating Co. will move Sept. 1 from 152 Apsley Street, Philadelphia, to 4543 Wayne Avenue, where it has taken the entire building to provide for expansion. Company represents David H. Smith & Sons, Inc., of Brooklyn, in the sale of punches and shears, angle bending rolls and other products, and is also exclusive agent for Western Iron Works, Philadelphia, manufacturer of cellar doors. It also handles a number of other lines, including pipe bending machines, band saws, press brakes, and similar equipment. G. A. Grewer is sole owner and manager.

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.60c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	4.90c.
Structural rivets	4.15c.
Boiler rivets	4.15c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

BIRMINGHAM

Some Increase in Foundry Buying, but Steel Quiescent

BIRMINGHAM, Aug. 26.—The pig iron melt appeared to spread a little last week. A few small foundries issued specifications for the first time in weeks and two or three large foundries ordered out more iron. Depleted stocks of consumers continue to force hurried shipments but they fail to influence forward contracting. Due to the little forward buying that has been done this quarter, there will be very little contract iron to be carried over into the fourth quarter and furnace interests are hopeful of more active buying. Sales this month have been averaging the lowest of the year. The base price of $14, Birmingham, is unchanged and applies to September shipments. The Tennessee company has banked its No. 5 furnace at Fairfield, reducing the number of active furnaces in the district to 13. Of this number nine are on foundry iron, three on basic and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$14.00
No. 1 fdy., 2.25 to 2.75 sil.	14.50
Basic	14.00

Finished Steel.—New business has failed to make any showing toward an increase, but the fact that demand has held up is a favorable factor. Sheet sales have been a little disappointing but the feeling exists that buying has been delayed. It is also believed that the wire jobbing trade is awaiting evidence of effects of recent drought on consumer demand. The Ensley rail mill continues to operate at around 50 per cent of capacity and other finishing mill operations range from 50 to 65 per cent of capacity. Prices are the same as last week. The Tennessee company is working four open-hearths at Ensley, a reduction of one, and five at Fairfield. The Gulf States Steel Co. continues to operate three at Alabama City. This makes a total of 12 open-hearths on the active list, 11 being idle. Tank fabricators report increased demand. Several hundred tons of plates will be required for eight large boilers to be made by the Hedges-Walsh-Weidner Co., Chattanooga. Structural steel jobs known to be pending are the lightest in several months.

Cast Iron Pipe.—The United States Pipe & Foundry Co. has booked upward of 4000 tons of pipe for Kenner, La. The American Cast Iron Pipe Co. is low bidder on 500 tons for Houston, Tex., and about 800 tons for Minneapolis. Included in pending business is 9500 ft. of 8-in. pipe and 2500 ft. of 6-in. pipe to be awarded by Hollywood, Fla., on Aug. 27. Rushton, La., has asked bids on 4000 ft. of 6-in. pipe. Pressure pipe manufacturers report a more favorable outlook for the next several weeks. A few shops have increased their output and operations in the district are now estimated to be between 60 and 70 per cent of capacity. Shipments are running close to output. Prices are unchanged at $37 to $38 a ton, base Birmingham.

Coke.—The Tennessee company has reduced the number of its active by-product ovens from 342 to 217. This leaves a total of 921 active ovens in the district out of the 1390 ovens available. Slow coking operations are reported in some instances. Demand for foundry coke is still quiet and shipments slow. The price of $5 a net ton, Birmingham, is unchanged.

Old Material.—With steel scrap available in the open market at bargain prices and mills consuming less than normal amount the dealers do not expect any early material improvement in the market. Cast iron grades show no change, the sales being of the lightest form. Quotations are unchanged and definite prices uncertain.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel		$12.00
Scrap steel rails	$12.50 to	13.00
Short shoveling turnings		9.00
Cast iron borings		9.00
Stove plate	11.50 to	12.00
Steel axles		20.00
Iron axles		23.00
No. 1 railroad wrought	10.00 to	10.50
Rails for rolling		14.50
No. 1 cast		13.00
Tramcar wheels		12.50
Cast iron carwheels	13.00 to	13.50
Cast iron borings, chem	13.50 to	14.00

PACIFIC COAST

Notably Large Bookings in Shapes and Concrete Bars

LOS ANGELES and SAN FRANCISCO, Aug. 23—(*By Air Mail*).—Indications point to a healthy increase in demand for iron and steel products on the Coast during the next three months. A number of new inquiries have recently come forth and bookings, on the whole, aggregated a fair tonnage.

The outstanding award involved 2000 tons of structural shapes for a new plant at Maywood, Cal., for the Consolidated Steel Corporation, to be fabricated by the owner. New inquiries include 3200 tons of shapes and 2000 tons of reinforcing bars for the Burrard Street bridge, Vancouver, B. C., bids on which will be opened Oct. 31.

Bookings of reinforcing steel bars were the second largest in over five weeks and totaled 1000 tons. The Soule Steel Co. secured 300 tons for an addition to a hotel in Pasadena. An unnamed interest took 300 tons for a warehouse for the Brunswig Drug Co. and 200 tons for a garage for the Southern California Edison Co., both in Los Angeles. Pending business exceeds 8000 tons. New inquiries cover 301 tons for a bridge in Los Angeles, 500 tons for an addition to a coliseum, Los Angeles, and 120 tons for two bridges at Portland. No change in out-of-stock prices has occurred recently, the San Francisco quotation being 2.50c., base, on carload lots, and the Los Angeles basis, 2.40c.

The only plate award of note went to the Western Pipe & Steel Co., and called for approximately 1000 tons for tanks for the new Procter & Gamble plant in Long Beach. Bids will be opened Sept. 5 for 1500 tons for a welded steel pipe line, for Anacortes, Wash. Prices continue to range from 2.15c. to 2.25c., c.i.f.

Structural shape awards were the largest in over seven weeks and exceeded 6300 tons. The Columbia Steel Co. secured 300 tons for a crossing in Tucson for the Southern Pacific Co. McClintic-Marshall Co. booked 1200 tons for a warehouse for the Brunswig Drug Co. on Second Street, Los Angeles, and the Consolidated Steel Corporation took 750 tons for a garage for the Southern California Edison Co. on South Hope Street, Los Angeles. Bids will be opened on Sept. 15 for 560 tons for the Atlantic Avenue bridge, Los Angeles. Plain material is quoted at 2.15c. to 2.25c., c.i.f.

Cast Iron Pipe.—Few awards were noted. The American Cast Iron Pipe Co. took 110 tons for Tacoma, Wash., and the U. S. Pipe & Foundry Co. secured 131 tons for Seattle. Bids have been opened on 504 tons for the Fresno County Water Works District No. 1, Fresno, Cal., involving 4 to 8-in. class 150 pipe. The National Cast Iron Pipe Co. is low bidder on 783 tons of 6 to 12-in. class 250 pipe for Glendale, Cal.

Pig iron prices per gross ton at San Francisco:

*Utah basic	$22.00 to $24.00
*Utah fdy., sil. 2.75 to 3.25	22.00 to 24.00
**Indian fdy., sil. 2.75 to 3.25	22.00 to 24.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.40c.
Black sheets (No. 24)	4.35c.
Blue ann'l'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.00c.
Struc. rivets, ½-in. and larger	5.00c.
Com. wire nails, base per keg	$3.35
Cement c't'd nails, 100 lb. keg	$3.35

William Stairs, Son & Morrow, Ltd., Halifax, Nova Scotia, and Mathews & Co., Orlando, Fla., have been appointed selling agents by the Murray Iron Works Co., Burlington, Iowa, manufacturer of steam turbines, engines and boilers.

BOSTON

Scrap Prices Higher Based on Strength at Pittsburgh—Pig Iron Buying Slack

BOSTON, Aug. 26.—Pig iron buying is within narrow limits. Not more than 3500 tons of iron is reported to have been sold in New England the past week. New York State furnaces and the Mystic Iron Works took more than half. Some Indian iron, equivalent to No. 2X, was moved at $19.75 to $20.25 a ton, on cars here, duty paid. About 600 tons of Alabama iron has recently been sold in this district. Buffalo No. 2 plain, No. 2X and No. 1X iron has sold at $16 a ton, furnace, but at least one furnace has obtained $16.50 for No. 1X the past week. Furnaces east of Buffalo are meeting the $16 price. Effective Aug. 25, new freight rates on pig iron from Boston and Everett, Mass., went into effect. Compared with former rates, advances and reductions are noted, but in no case of great importance to the furnace or the consumer of pig iron. Possibly the greatest important difference is found in the rate from Everett to Westfield, Mass. The rate formerly was $2.39 a ton, while now it is $2.45. Rates from here to Maine and other distant points have changed noticeably, but pig iron consumption at such points is inconsequential.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25..	$20.28
†Buffalo, sil. 2.25 to 2.75..$20.28 to	20.78
*Buffalo, sil. 1.75 to 2.25..	20.91
*Buffalo, sil. 2.25 to 2.75.. 20.91 to	21.41
Va., sil. 1.75 to 2.25.....	25.21
Va., sil. 2.25 to 2.75.....	25.71
*Ala., sil. 1.75 to 2.25.....	22.61
*Ala., sil. 2.25 to 2.75.....	23.11
†Ala., sil. 1.75 to 2.25.....	18.75
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Freight rates: $4.91 all rail and $4.28 rail and water from Buffalo; $5.21 all rail from Virginia; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex	*3.55c. to 5.55c.
Squares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Coke.—By-product foundry coke makers say there will be no change in the price of that product on Sept. 1.

Reinforcing Bars.—Sales of billet steel bars the past week were about 500 tons, of which half was for a Cambridge, Mass., manufacturing plant. Quite a few small jobs are up for figuring, while some old round tonnages are being refigured, but the market generally is quiet. Prices are as follows: One to 5 tons, 3.15c. a lb., base, from local stock; 6 to 99 tons, 2.65c.; 100 ton lots and larger, 2.55c. Rail steel bars are 2.26½c. a lb., delivered Boston freight rate points.

Fabricated Steel.—Fabricators contracted for upward of 3000 tons of material the past week. It is expected that 2000 tons will be placed this week for a Bucksport, Me., bridge, bidding on which has been rather limited owing to the difficult work involved. Figures will be taken this week for an Everett, Mass., hospital, a Harvard College unit and a bridge at Mexico-Peru, Me.

Old Material.—Higher prices on No. 1 heavy melting steel in the Pittsburgh district are reflected here to a certain degree, some brokers having raised bids on this material to as high as $9.55 a ton, on cars shipping point. A majority of the trade, however, are adhering to $9.05 to $9.30 a ton. For forge scrap there is no market, and buying of other materials used outside New England is limited to small tonnages. For eastern Pennsylvania delivery brokers are paying $13.50 a ton, on cars, or close to that price, for shafting, but for Pittsburgh district delivery $14 to $14.50 is offered. Axles for Pittsburgh delivery are $16.50 a ton, f.o.b., and for delivery points farther north, $17 to $17.50. The New England market for stove plate is stagnant, the one current consumer offering such low prices brokers are not interested. The cast material market also is more or less uncertain, so far as New England delivery is concerned, because of a lack of consumption. Some car lots of No. 1 machinery cast for delivery outside New England are being booked at $7 a ton, f.o.b. The General Electric Co. on Aug. 27 will close bids on a small list of scrap. Prospects of export business at the moment appear uncertain.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel..	$9.05 to $9.55
Scrap T rails	8.60 to 9.00
Scrap girder rails	7.60 to 7.75
No. 1 railroad wrought..	7.00 to 7.50
Machine shop turnings	4.10 to 4.35
Cast iron borings (steel works and rolling mill)	4.10 to 4.35
Bundled skeleton, long	6.10 to 6.50
Forge flashings	7.25 to 7.75
Blast furnace borings and turnings	3.10 to 3.60
Forge scrap	6.10 to 6.50
Shafting	13.50 to 14.50
Steel car axles	16.50 to 17.50
Wrought pipe, 1 in. in diameter (over 2 ft. long)	7.00 to 7.60
Rails for rolling	9.00 to 9.25
Cast iron borings, chemical	9.10 to 9.60
Prices per gross ton deliv'd consumers' yards:	
Textile cast	$11.50 to $12.00
No. 1 machinery cast	13.00 to 14.00
No. 2 machinery cast	11.00 to 11.50
Stove plate	8.50 to 9.50
Railroad malleable	16.00 to 16.25

YOUNGSTOWN

Some Improvement in Steel Demand and Operations Apparent

YOUNGSTOWN, Aug. 26.—Steel makers in the Mahoning and Shenango Valleys believe that the long-awaited upturn in the requirements for flat-rolled steel products has come. This week 28 open-hearth furnaces in the Valley are active, a gain of three from the preceding week. Of 120 Valley sheet mills, 52 are rolling, representing a moderate increase. For the first time in many weeks, all of the strip mills in the Youngstown district are active. Tin plate capacity is engaged at 70 per cent, with steel bar mills at 60 to 65 per cent.

The Carnegie Steel Co. is operating its properties in this area at 55 to 60 per cent, with three blast furnaces on at the Ohio works. The Youngstown Sheet & Tube Co. reports average schedules of 55 per cent, and the Republic Steel Corporation, 65 per cent. The Newton Steel Co. is averaging 30 per cent, unchanged from preceding weeks.

Pipe mill departments continue to maintain the lead in finished steel, with enough unfilled business to support a near-capacity rate in electric welding, seamless and lapweld mills over the remainder of the year. The Republic company is obliged to draw upon its Warren open-hearth plant to the extent of 2000 tons of ingots monthly, and plans enlargement of its open-hearth department at Youngstown, at an estimated cost of $1,000,000. In addition, the blast furnace at Warren, which supplies hot metal to Republic's Warren steel plant, will be blown out about Sept. 1 for relining and enlargement, and its capacity will be increased to 1000 tons per day from 700 tons, the present capacity. Other betterments are also planned for the Warren property, where Republic specializes in the production of flat-rolled steels.

Improvement is already apparent in the demand for sheets and strips from the automobile industry, and shipping instructions by the Ford Motor Co. show enlarged tonnages required over the next 30 days.

Great Lakes Steel Corporation, Detroit, will have its new hot strip mill in operation next month and is booking orders for delivery in the latter part of September.

BIRMINGHAM

Some Increase in Foundry Buying, but Steel Quiescent

BIRMINGHAM, Aug. 26.—The pig iron melt appeared to spread a little last week. A few small foundries issued specifications for the first time in weeks and two or three large foundries ordered out more iron. Depleted stocks of consumers continue to force hurried shipments but they fail to influence forward contracting. Due to the little forward buying that has been done this quarter, there will be very little contract iron to be carried over into the fourth quarter and furnace interests are hopeful of more active buying. Sales this month have been averaging the lowest of the year. The base price of $14, Birmingham, is unchanged and applies to September shipments. The Tennessee company has banked its No. 5 furnace at Fairfield, reducing the number of active furnaces in the district to 13. Of this number nine are on foundry iron, three on basic and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 si. $14.00
No. 1 fdy., 2.25 to 2.75 si. 14.50
Basic 14.00

Finished Steel.—New business has failed to make any showing toward an increase, but the fact that demand has held up is a favorable factor. Sheet sales have been a little disappointing but the feeling exists that buying has been delayed. It is also believed that the wire jobbing trade is awaiting evidence of effects of recent drought on consumer demand. The Ensley rail mill continues to operate at around 50 per cent of capacity and other finishing mill operations range from 50 to 65 per cent of capacity. Prices are the same as last week. The Tennessee company is operating four open-hearths at Ensley, a reduction of one, and two at Fairfield. The Gulf States Steel Co. continues to operate three at Alabama City. This makes a total of 12 open-hearths on the active list, 11 being idle. Tank fabricators report increased demand. Several hundred tons of plates will be required for eight large boilers to be made by the Hedges-Walsh-Weidner Co., Chattanooga. Structural steel jobs known to be pending are the lightest in several months.

Cast Iron Pipe.—The United States Pipe & Foundry Co. has booked upward of 4000 tons of pipe for Kenner, La. The American Cast Iron Pipe Co. is low bidder on 500 tons for Shreveport, Tex., and about 800 tons for Minneapolis. Included in pending business is 9500 ft. of 8-in. pipe and 2500 ft. of 6-in. pipe to be awarded by Hollywood, Fla., on Aug. 27. Ruston, La., has asked bids on 800 ft. of 6-in. pipe. Pressure pipe manufacturers report a more favorable outlook for the next several weeks. A few shops have increased their output and operations in the district are now estimated to be between 40 and 50 per cent of capacity. Shipments are running close to output. Prices are unchanged at $37 to $38 a ton, base Birmingham.

Coke.—The Tennessee company has reduced the number of its active by-product ovens from 342 to 217. This leaves a total of 321 active ovens in the district out of the 1390 ovens available. Slow coking operations are reported in some instances. Demand for foundry coke is still quiet and shipments slow. The price of $5 a net ton, Birmingham, is unchanged.

Old Material.—With steel scrap available in the open market at bargain prices and mills consuming less than normal amount the dealers do not expect any early material improvement in the market. Cast iron grades show no change, the sales being of the lightest form. Quotations are unchanged and definite prices uncertain.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$12.00
Scrap steel rails	$12.50 to 13.00
Short shoveling turnings	9.00
Cast iron borings	9.00
Stove plate	11.50 to 12.00
Steel axles	20.00
Iron axles	23.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.50
No. 1 cast	13.00
Tramcar wheels	12.50
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Cast iron borings, chem.	13.50 to 14.00

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*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.40c.
Steel bars (Nos. 1 to 4)	3.40c.
Steel bars (Nos. 5 to 10)	4.35c.
Steel bars (Nos. 10 to 19)	3.80c.
Steel bars (Nos. 20 to 24)	5.00c.
Steel bars (Nos. 25 and larger)	5.00c.
Black pipe, ½-in. butt, per hundred feet	$3.35
Galvanized pipe, ½-in. butt, per hundred feet	$3.25

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BOSTON

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†Buffalo, sil. 2.25 to 2.75..$20.28 to	20.78
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Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
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Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
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Rounds and hex	*2.55c. to 5.55c.
Squares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
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Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$9.05 to $9.55
Scrap T rails	8.60 to 9.00
Scrap girder rails	7.60 to 7.75
No. 1 railroad wrought	7.00 to 7.50
Machine shop turnings	4.10 to 4.35
Cast iron borings (steel works and rolling mill)	4.10 to 4.35
Bundled skeleton, long	6.10 to 6.50
Forge flashings	7.25 to 7.75
Blast furnace borings and turnings	2.10 to 2.60
Forge scrap	6.10 to 6.50
Shafting	13.50 to 14.50
Steel car axles	16.50 to 17.50
Wrought pipe, 1 in. in diameter (over 2 ft. long)	7.00 to 7.60
Rails for rolling	9.00 to 9.25
Cast iron borings, chemical	9.10 to 9.60

Prices per gross ton deliv'd consumers' yards:

Textile cast	$11.50 to $12.00
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YOUNGSTOWN, Aug. 26.—Steel makers in the Mahoning and Shenango Valleys believe that the long-awaited upturn in the requirements for flat-rolled steel products has come. This week 28 open-hearth furnaces in the Valley are active, a gain of three from the preceding week. Of 120 Valley sheet mills, 52 are rolling, representing a moderate increase. For the first time in many weeks, all of the strip mills in the Youngstown district are active. Tin plate capacity is engaged at 70 per cent, with steel bar mills at 60 to 65 per cent.

The Carnegie Steel Co. is operating its properties in this area at 55 to 60 per cent, with three blast furnaces on at the Ohio works. The Youngstown Sheet & Tube Co. reports average schedules of 55 per cent, and the Republic Steel Corporation, 65 per cent. The Newton Steel Co. is averaging 30 per cent, unchanged from preceding weeks.

Pipe mill departments continue to maintain the lead in finished steel, with enough unfilled business to support a near-capacity rate in electric welding, seamless and lapweld mills over the remainder of the year. The Republic company is obliged to draw upon its Warren open-hearth plant to the extent of 2000 tons of ingots monthly, and plans enlargement of its open-hearth department at Youngstown, at an estimated cost of $1,000,000. In addition, the blast furnace at Warren, which supplies hot metal to Republic's Warren steel plant, will be blown out about Sept. 1 for relining and enlargement, and its capacity will be increased to 1000 tons per day from 700 tons, the present capacity. Other betterments are also planned for the Warren property, where Republic specializes in the production of flat-rolled steels.

Improvement is already apparent in the demand for sheets and strips from the automobile industry, and shipping instructions by the Ford Motor Co. show enlarged tonnages required over the next 30 days.

Great Lakes Steel Corporation, Detroit, will have its new hot strip mill in operation next month and is booking orders for delivery in the latter part of September.

CINCINNATI

Pig Iron Prices Weak, with Competition Keen for Small Orders

CINCINNATI, Aug. 26.—With consumers holding purchases to actual needs and with the current demand limited to spot shipments, competition for pig iron business has become very keen. Reports of lower prices on both Northern and Southern iron are heard. In some instances, furnaces which adhere to scheduled prices have lost business and are told that their prices are too high. Total sales in this district last week were about 1500 tons, of which only about 150 tons was Southern iron in carload lots. Except for 500 tons of Northern foundry iron for an eastern Ohio consumer, all of the Northern iron sales were in carload lots. Although the foundry melt continues to be very low, improvement is expected by the middle of next month. The only pending inquiry is from a central Ohio buyer, who seeks 500 to 1000 tons of Northern foundry iron.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89 to $21.39
Ala. fdy., sil. 1.75 to 2.25	15.69 to 16.69
Ala. fdy., sil. 2.25 to 2.75	16.19 to 17.19
Tenn. fdy., sil. 1.75 to 2.25	15.69 to 16.69
S'th'n Ohio silvery, 8 per cent	24.39

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Coke.—Demand for foundry grades of coke continues dull. The reduction in quotations, effective Aug. 1, failed to stimulate business. Prices on by-product foundry coke, however, will continue at about $9, delivered in Cincinnati, in September.

Finished Steel.—Demand for sheets is slow and spotty. Fresh bookings last week were approximately 35 to 40 per cent of normal capacity and operations this week are at 40 per cent of capacity. The slight spurt in radio demand a week ago has subsided. No improvement in demands from the automobile industry has materialized.

Old Material.—Difficulty in obtaining good rails for melting is causing scrap dealers to bid 25c. more for this material. New business is small. Dealers are awaiting the trend of mill operations.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$11.25 to $11.75
Scrap rails for melting	12.00 to 12.50
Loose sheet clippings	7.75 to 8.25
Bundled sheets	9.75 to 10.25
Cast iron borings	7.75 to 8.25
Machine shop turnings	7.25 to 7.75
No. 1 busheling	9.50 to 10.00
No. 2 busheling	6.00 to 6.50
Rails for rolling	13.00 to 13.50
No. 1 locomotive tires	13.50 to 14.00
No. 2 railroad wrought	11.25 to 11.75
Short rails	17.00 to 17.50
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.25 to 8.75
Stove plate	8.25 to 8.75
Brake shoes	8.25 to 8.75
Agricultural malleable	14.00 to 14.50
Railroad malleable	15.00 to 15.50

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.35c.
Cold-fin. rounds and hex	3.80c.
Squares	4.30c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb	$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100 lb	10.25
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$16.50
4-in.	34.50
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00

BUFFALO

Pig Iron Sales 5000 Tons—Steel Mill Operations Unchanged

BUFFALO, Aug. 26.—Sales of pig iron in the past week totaled about 5000 tons. In this volume were very few large lots, although two orders for 500 tons of foundry from the East were included. District sales have been very light, and there are no large inquiries pending. Furnace operations are unchanged.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$18.50
No. 2X fdy., sil. 2.25 to 2.75	19.00
No. 1 fdy., sil. 2.75 to 3.25	20.00
Malleable, sil. up to 2.25	19.00
Basic	17.50
Lake Superior charcoal	27.28

Finished Steel.—Little change is noted in the operation of Buffalo mills. The Lackawanna plant of the Bethlehem Steel Co. is operating 15 of its 24 open-hearths and the Donner division of the Republic Steel Corporation is operating four out of nine. The Wickwire-Spencer Corporation is operating three of four open-hearths. The Seneca Iron & Steel Co. is running at between 50 and 60 per cent, a slight improvement. The reinforcing bar market and the fabricated structural market show no outstanding bookings. J. W. Cowper has been awarded the general contract for the new market terminal, which will require 600 to 700 tons of reinforcing bars.

Old Material.—Shutting down of one radiator plant for a week and reduced operation at another has decreased the demand for stove plate and No. 1 machinery cast. Some dealers report a little difficulty in filling the recent $13.50 order for No. 1 heavy melting steel. They assert that higher prices at Pittsburgh and Valley points are partially responsible for this. General production of scrap is off except that country scrap appears to be accumulating. Barge shipments of No. 1 and No. 2 heavy melting steel are coming in freely and the usual shipments of hydraulic compressed sheets and drop forge flashings from Detroit are being made regularly. The largest consumer in the district is now beginning to receive No. 1 and No. 2 heavy melting steel by barge from New York.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:	
No 1 heavy melting steel	$12.75 to $13.25
No. 2 heavy melting scrap	11.00 to 11.50
Scrap rails	12.00 to 12.50
Hydraulic comp. sheets	11.25 to 12.25
Hand bundled sheets	9.00 to 9.50
Drop forge flashings	11.00 to 11.50
No. 1 busheling	11.25 to 12.50
Hvy. steel axle turnings	11.00 to 11.50
Machine shop turnings	6.00 to 7.00
No. 1 railroad wrought	10.00 to 10.50
Acid Open-Hearth Grades:	
Knuckles and couplers	15.00 to 15.50
Coil and leaf springs	15.00 to 15.50
Rolled steel wheels	15.00 to 15.50
Low phos. billet and bloom ends	16.50 to 17.00
Electric Furnace Grades:	
Short shov. steel turnings	9.75 to 10.25
Blast Furnace Grades:	
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
No. 2 busheling	7.00
Rolling Mill Grades:	
Steel car axles	16.00 to 16.50
Iron axles	19.00 to 19.50
Cupola Grades:	
No. 1 machinery cast	11.00 to 12.00
Stove plate	10.25 to 10.50
Locomotive grate bars	8.25 to 9.25
Steel rails, 3 ft. and under	16.00 to 16.50
Cast iron carwheels	13.50 to 14.00
Malleable Grades:	
Industrial	14.25 to 15.25
Railroad	14.25 to 15.25
Agricultural	14.25 to 15.25
Special Grades:	
Chemical borings	11.50 to 12.00

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.15c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq	3.65c.
Rounds and hex	3.15c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.60c.
Bands	3.50c.
Hoops	3.90c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.20
Black wire, base per 100 lb	3.50

Fabricated Steel Plate Orders Lower

WASHINGTON, Aug. 26.—Orders for fabricated steel plate in July totaled 30,862 tons, against 34,073 tons in June, according to reports received by the Department of Commerce from 48 firms. Orders in the first seven months aggregated 251,137 tons, compared with 333,781 tons in the corresponding period of last year.

July orders were distributed as follows: Oil storage tanks, 10,850 tons; refinery materials and equipment, 3271 tons; tank cars, 1316 tons; gas holders, 2736 tons; blast furnaces, 102 tons; and stacks and miscellaneous, 12,587 tons.

Non-Ferrous Metal Markets

Copper Inactive—Larger Tin Sales—Lead Steady—Zinc Lower

NEW YORK, Aug. 26.

Copper.—Demand for copper from either domestic or foreign consumers continues very light. The price situation is rather mixed. Demand, which is mostly for carload and small lots from domestic consumers, is being satisfied by primary producers at 11c. and by custom smelters at 10.75c., delivered in the Connecticut Valley. The quotable range, therefore, is 10.75c. to 11c.

Foreign consumers are still obliged to pay 11.30c. c.i.f., usual European ports, which is the quotation of Copper Exporters, Inc. Because they know that some metal is available below the corresponding domestic price, they are slow to place orders. Thus far this month sales to foreign consumers have been about 21,000 tons, which is not more than one-third of the sales for the same period last month. Their requirements, based upon the average for the last six months, have not been covered fully for September or October. Domestic consumers are fully covered for September, for a large majority of their October needs, and for a fair proportion of their November requirements. Lake copper is very quiet at 11c. to 11.12½c., delivered.

Tin.—Sales of Straits tin for the past week were about 900 tons, which is a pretty fair volume considering business conditions. Most of it was for nearby delivery and taken largely by consumers, although some of the business was spread out over the next 10 to 12 months. Prices continue to hover very closely to the 30c. level, with spot Straits tin quoted today at 29.50c., New York, with a fair business reported.

Stocks in London warehouses again increased last week, the total for the week ended Saturday, Aug. 23, having been 25,301 tons, or 422 tons more than the week before. The total is unprecedented, with increases nearly every week of 300 to 400 tons. A feature today was the fact that sales in the East, at 75 tons, were the smallest for any weekday in a long period. London prices today were about £3 per ton less than a week ago, with spot standard at £132 15s., future standard at £134 7s. 6d., and spot Straits at £134 5s. The Singapore price today was £137 7s. 6d.

Lead.—During the week one producer in the Middle West was reported to have sold a limited amount of metal at 5.30c., St. Louis. Generally, however, the quotation now is 5.35c., with the leading producer there having no difficulty in obtaining this price for the present demand, which is limited to carload and small lots. The quotation of the leading interest continues unchanged at 5.50c., New York.

Zinc.—Demand for prime Western zinc is almost negligible and a fair test of prices is lacking. The general quotation is 4.30c., East St. Louis, or 4.65c., New York, at which levels the few orders for carload and small lots are going. It is doubtful whether a desirable order would bring out any lower quotations from producers.

Ore at Joplin is weaker, the quotation at the end of last week having been $30 to $31 as against $32 a ton the previous week. Sales to smelters, however, were very small at only 3670 tons. Production of ore was large at 8000 tons, leaving the surplus at about 29,225 tons, reported to be strongly held.

Antimony. — Demand for Chinese metal is very quiet, with reports of some difficulty in getting shipments. Quotations are unchanged at 7.75c., New York, duty paid, for prompt metal, with futures at 7.37½c. to 7.50c.

Nickel.—The long-established quotations continue, with ingot nickel in wholesale lots at 35c. a lb., with shot nickel at 36c., and with electrolytic nickel in cathodes at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable at the published price of 22.90c. a lb., delivered.

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Aug. 26	Aug. 25	Aug. 23	Aug. 22	Aug. 21	Aug. 20
Lake copper, New York	11.12½	11.12½	11.12½	11.12½	11.12½	11.12½
Electrolytic copper, N. Y.*	10.50	10.50	10.50	10.50	10.50	10.50
Straits tin, spot, N. Y.	29.50	29.75	....	30.00	30.05	29.95
Zinc, East St. Louis	4.30	4.30	4.30	4.30	4.30	4.30
Zinc, New York	4.65	4.65	4.65	4.65	4.65	4.65
Lead, East St. Louis	5.35	5.35	5.35	5.30	5.35	5.35
Lead, New York	5.50	5.50	5.50	5.50	5.50	5.50

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Non-Ferrous Metals at Chicago

CHICAGO, Aug. 26.—For the third consecutive week sales of non-ferrous metals have shown moderate gains.

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	17.75c.
Copper, hot rolled, base sizes	20.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes	23.00c.
Seamless Tubes—	
Brass	22.75c.
Copper	23.00c.
Brass Rods	16.12½c.
Brazed Brass Tubes	25.37½c.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	9.75c. to 10.25c.
Zinc sheets, open	10.75c. to 11.25c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	32.50c. to 33.50c.
Tin, bar	34.50c. to 35.50c.
Copper, Lake	12.75c.
Copper, electrolytic	12.50c.
Copper, casting	12.25c.
Zinc, slab	6.25c. to 7.25c.
Lead, American pig	6.50c. to 7.00c.
Lead, bar	8.50c. to 9.00c.
Antimony, Asiatic	10.00c. to 10.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	24.00c. to 25.00c.
Alum. ingots, No. 12 alloys	23.00c. to 24.00c.
Babbitt metal, commercial grade	25.00c. to 35.00c.
Solder, ½ and ½	22.50c. to 23.50c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	35.00c.
Tin, bar	37.00c.
Copper, Lake	12.25c.
Copper, electrolytic	12.25c.
Copper, casting	11.75c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig	6.25c. to 6.50c.
Lead, bar	8.75c.
Antimony, Asiatic	12.50c.
Babbitt metal, medium grade	17.50c.
Babbitt metal, high grade	38.00c.
Solder, ½ and ½	21.75c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (Prices quoted are nominal. Holders of metal are generally unwilling to part with stock at present low levels.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	9.00c.	10.00c.
Copper, hvy. and wire	8.75c.	9.75c.
Copper, light and bottoms	7.50c.	8.50c.
Brass, heavy	5.00c.	6.25c.
Brass, light	4.50c.	5.75c.
Hvy. machine composition	7.75c.	8.75c.
No. 1 yel. brass turnings	5.50c.	6.50c.
No. 1 red brass or compos. turnings	7.00c.	8.00c.
Lead, heavy	4.25c.	4.75c.
Lead, tea	3.00c.	3.50c.
Zinc	2.25c.	2.75c.
Sheet aluminum	7.50c.	9.50c.
Cast aluminum	7.00c.	9.00c.

Prices for copper, after sinking to lower levels during the week, have regained all lost ground. The old metal market remains quiet.

Prices per lb., in carload lots: Lake copper, 11.125c. to 11.25c.; tin, 30.45c.; lead, 5.45c.; zinc, 4.40c.; in less-than-carload lots, antimony, 9c. On old metals we quote copper wire, crucible shapes and copper clips, 9c.; copper bottoms, 7.25c. to 7.75c.; red brass, 7.25c. to 7.75c.; yellow brass, 5c. to 5.50c.; lead pipe, 4c.; zinc, 1.50c. to 1.75c.; pewter, No. 1, 15c.; tin-foil, 17.50c.; block tin, 22.50c.; aluminum, 7c. to 7.50c.; all being dealers' prices for less-than-carload lots.

Fabricated Structural Steel

Awards of 40,000 Tons Equal Those of Preceding Week—New Work Amounts to 26,000 Tons

FABRICATED structural steel awards in the week call for about 40,000 tons of steel. About 26,000 tons of new work came into the market for bids, but a large portion of this is in the New York district. Outstanding among the awards were 6000 tons for a nurses' home and power plant at New York Hospital, New York City; 4325 tons for an assembly plant at Buffalo for the Ford Motor Co.; 3800 tons for railroad grade separation work at Dearborn, Mich., and 7400 tons in Canada for a power plant. The largest new projects are 2500 tons for a New York apartment building, 3500 tons for railroad grade separation work at Detroit and 3200 tons for a bridge at Vancouver, B. C. Awards follow:

North Atlantic States

LOWELL, MASS., 490 tons, Post Office, to Eastern Bridge & Structural Co.

BOSTON, 373 tons, garage, Boston Elevated Railway, to New England Structural Co.

BOSTON, 200 tons, Charles River bridge caissons, to Walsh-Holyoke Steam Boiler Works.

DUDLEY, MASS., 175 tons, State bridge, to Eastern Bridge & Structural Co.

PLYMOUTH, N. H., 130 tons, State bridge, to Berlin Construction Co.

TORRINGTON, CONN., 200 tons, telephone building, to Levering & Garrigues Co.

NEW YORK, 6000 tons, Nurses Home and power plant for New York Hospital, to Harris Structural Steel Co.

NEW YORK, 1500 tons, Juilliard School of Music, 122nd Street, to Hedden Iron Construction Co.

NEW YORK, 250 tons, loft building at 318 East Thirty-seventh Street, to Easton Structural Steel Co.

PHILADELPHIA, 590 tons, Drexel Institute, women's dormitory, to Bethlehem Steel Co.

BALTIMORE, 1000 tons, Arundel Corporation, to American Bridge Co.

BUFFALO, 4325 tons, assembly building for Ford Motor Co., to Whitehead & Kales Co.

The South

COPPERHILL, TENN., 300 tons, machine shop for Tennessee Copper Co., to Ingalls Iron Works.

Central States

GRAND TRUNK RAILROAD, 160 tons, bridge at Okemos, Mich., to McClintic-Marshall Co.

BATTLE CREEK, MICH., 1150 tons Central National Tower building, to Whitehead & Kales Co.

DEARBORN, MICH., 3800 tons, Miller Road and Michigan Central grade separation, to American Bridge Co.

PORTSMOUTH, OHIO, 230 tons, train shed, to McClintic-Marshall Co.

WILLOUGHBY, OHIO, 200 tons, building for Ohio Rubber Co., to Massillon Bridge & Structural Co.

FORT WAYNE, IND., 350 tons, building for General Electric Co., to Austin Co.

EVANSTON, ILL., 600 tons, subway for Milwaukee Road, to McClintic-Marshall Co.

LAWSON, MO., 500 tons, bridge for Rock Island Railroad, to American Bridge Co.

Western States

BARTLESVILE, OKLA., 660 tons, Phillips Petroleum Co., to Kansas City Structural Steel Co.

CASCADE, WASH., 350 tons, bridge, to Minneapolis-Moline Power & Implement Co.

TUCSON, ARIZ., 300 tons, Seventh Avenue Crossing for Southern Pacific Co., to Columbia Steel Co.

LOS ANGELES, 750 tons, garage for Southern California Edison Co., to Consolidated Steel Corporation.

LOS ANGELES, 1200 tons, warehouse, for Brunswig Drug Co., to McClintic-Marshall Co.

MAYWOOD, CAL., 2000 tons, plant for Consolidated Steel Corporation, owner to fabricate material.

TRONA, CAL., 250 tons, factory, to Consolidated Steel Corporation.

SAN FRANCISCO, 400 tons, Pier No. 1, to Moore Dry Dock Co.

PORTLAND, ORE., 113 tons, bridge over Frying Pan Creek, to Wallace Bridge & Structural Steel Co.

Canada

MONTREAL, 7400 tons for Beauharnois Power Corporation; 4800 tons to Dominion Bridge Co. and 2600 tons to Canadian Vickers, Ltd.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

North Atlantic States

LAWRENCE, MASS., 516 tons, theater and office building.

MEXICO-PERU, ME., 370 tons, State bridge.

BOSTON, 100 tons. Quincy Market Cold Storage & Warehouse Co. addition.

MALDEN, MASS., 200 tons, hospital.

EAST ORANGE, N. J., 900 tons, telephone building.

JERSEY CITY, N. J., tonnage unstated, power house and laundry for Jersey City Hospital.

BROOKLYN, 1750 tons, apartment building at 45 Prospect Park West.

JAMAICA, N. Y., 500 tons, public school No. 123.

NEW YORK, 1400 tons, office building at Hanover Square and Beaver Street; Fred T. Ley Co., general contractor.

NEW YORK, 2500 tons, apartment building at Ninety-second Street and Central Park West.

NEW YORK, 1200 tons, office building at 101 Wall Street; Shroder & Koppel, general contractors.

NEW YORK, 1000 tons, apartment building at 422 East Eighty-sixth Street.

NEW YORK, 1000 tons, apartment building at 361 West Twenty-third Street.

NEW YORK, 500 tons, Seamen's Y. M. C. A. building at Eleventh Avenue and Twentieth Street.

BROOKLYN, 1000 tons, Brooklyn hospital.

NEW YORK, 1600 tons, alterations to Manhattan Bridge Plaza.

NEW YORK, 425 tons, Baltimore & Ohio Railroad grade elimination on Staten Island.

ALBANY, N. Y., 600 tons, R. K. O. theater and office building.

SCHENECTADY, 400 tons, R. K. O. theater and office building.

BINGHAMTON, N. Y., 250 tons, Nurses' Home.

TRENTON, N. J., 200 tons, research laboratory for John A. Roebling Sons' Co.

The South

STATE OF NORTH CAROLINA, 400 tons, highway bridges.

Central States

DETROIT, 3500 tons, Michigan Central grade crossing separations, American Bridge Co. low bidder.

NILES CENTER, ILL., 500 tons, car shops for Chicago Rapid Transit Co.

BELLEVILLE, ILL., 1800 tons, track elevation for Indiana Harbor Belt Railway.

CHICAGO, 1600 tons, bridge in Lincoln Park; Paschen Brothers low bidders on general contract.

CHICAGO HEIGHTS, 500 tons, high school; Machuda Brothers low bidders on general contract.

TOLEDO, OHIO, 350 tons, factory building; A. Bentley & Son Co. awarded general contract.

Western States

EL DORADO, ARK., 350 tons, Post Office.

LOS ANGELES, 560 tons, bridge over Los Angeles River at Atlantic Avenue; bids Sept. 15.

Canada

VANCOUVER, B. C., 3200 tons, Burrard Street bridge; bids Oct. 31.

Railroad Equipment

Illinois Steel Co., Chicago, has ordered 95 ingot cars from American Car & Foundry Co.

American Smelting & Refining Co., New York, has placed 75 25-ton gondola cars with the Koppel Industrial Car & Equipment Co.

New York, New Haven & Hartford Railroad is inquiring for two steel underframes for wire train cars.

Standard Oil Co. of Indiana is inquiring for seven 50-ton gondola cars.

Republic Steel Is to Spend $1,000,000 for Expansion

The Republic Steel Corporation shortly will start work on the $1,000,000 expansion program for the open-hearth department of its Youngstown works. This plant now has 15 open-hearth furnaces, all but two of which are of 85-ton capacity. The 13 smaller furnaces will be enlarged to 110-ton capacity. The monthly capacity of the open-hearth division will be increased from 72,000 to 95,000 tons. An addition to the open-hearth building will be erected and three 275-ton ladle cranes, the largest ever built in this country, will be installed.

Reinforcing Steel

Awards of 10,000 Tons the Largest in Many Weeks

LETTINGS of reinforcing steel the past week, totaling 10,000 tons, were the largest since May 15. The Beauharnois Power Corporation, Montreal, will take 4000 tons for a power project and 2000 tons is required for a power plant and dam at Safe Harbor, Pa. New inquiries amount to 8000 tons, also the largest in several weeks. A street bridge at Vancouver, B. C., calls for 2000 tons. Awards follow:

CAMBRIDGE, MASS., 250 tons, F. W. Webster Co. plant, to Concrete Steel Co.

BUCKSPORT, ME., 100 tons, bridge; placed by Merritt-Chapman & Scott Corporation, New York, with Concrete Steel Co.

NEW YORK, 100 tons, viaducts for New York Central Railroad at Sixty-fifth Street; placed by H. H. Sherwin & Co., New York, with Truscon Steel Co.

JONES BEACH, LONG ISLAND, N. Y., 100 tons, bath houses; placed by Eureka Fire Proofing Co., Brooklyn, with Carroll-McCreary Co.

PASSAIC, N. J., 180 tons, distribution plant for Public Service Electric Co., to Igoe Brothers.

ASBURY PARK, N. J., 250 tons, hospital, to Truscon Steel Co.

MONTREAL, 4000 tons, for Beauharnois Power Corporation, divided among Canadian Car & Foundry Co., Peck Rolling Mills, Steel Co. of Canada, Ltd., Canadian Tube & Steel Products Co.

SAFE HARBOR, PA., 2000 tons, dam and power plant project, from Arundel Corporation, general contractor, to Kalman Steel Co.

CLEVELAND, 750 tons, Brecksville Road bridge, to Truscon Steel Co.

COOK COUNTY, ILL., 100 tons, road work, to Concrete Engineering Co.

SPRINGFIELD, ILL., 300 tons, road work, to unnamed bidders.

CHICAGO, 300 tons, apartment building at 1260 Aster Street, to Concrete Engineering Co.

CHICAGO, 125 tons, Lawson Memorial Y. M. C. A., to Olney J. Dean & Co.

SOUTH CHICAGO, 375 tons, grain elevator, to Inland Steel Co.

GLENCOE, ILL., 125 tons, substation for Public Service of Northern Illinois, to Calumet Steel Co.

OLYMPIA, WASH., 100 tons, highway work, to Northwest Steel Rolling Mills.

MAYWOOD, CAL., 100 tons, plant for Consolidated Steel Corporation, to an unnamed bidder.

LOS ANGELES, 200 tons, garage for Southern California Edison Co., to an unnamed bidder.

PASADENA, CAL., 300 tons, hotel addition to Soule Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

PHILADELPHIA, 1000 tons, Market Street subway; bids close Sept. 5.

PENNSYLVANIA RAILROAD, 800 tons, cattle building; bids close Sept. 4.

ENGLEWOOD, N. J., 700 tons, approaches to Fort Lee bridge; general contract bids to be taken next week.

HACKENSACK, N. J., 800 tons, State highway to Arcola, N. J.; general contract bids taken Aug. 26.

CLEVELAND, 200 tons, Higbee department store.

CHICAGO, tonnage being estimated, Richter-Foot Products Co.

CHICAGO, 300 tons, International House for University of Chicago.

CHICAGO, 200 tons, outer drive.

COOK COUNTY, ILL., 600 tons, highway bridges.

WILMETTE, ILL., 100 tons, Bahai Temple.

PORTLAND, ORE., 120 tons, two bridges on Wilson River; bids Aug. 28.

VANCOUVER, B. C., 2000 tons, Burrard Street bridge; bids Oct. 31.

LOS ANGELES, 301 tons, Atlantic Street bridge; bids Sept. 15.

LOS ANGELES, 150 tons, Apartment building, Sixth and St. Louis Streets; bids being taken.

LOS ANGELES, 500 tons, addition to coliseum, Exposition Park; bids being taken.

LOS ANGELES, 150 tons, apartment building, Argyle Avenue; bids being taken.

Long Suspension Bridge Across Hudson River Built in Quick Time

ANOTHER long-span steel suspension bridge, of which there are only a few in the United States, has been completed at Poughkeepsie, N. Y., spanning the Hudson River between that point and Highland, N. Y. It was opened to traffic last week, and, if used to capacity, will accommodate 12,000,000 automobiles a year. It is the only bridge over the Hudson between Bear Mountain and Castleton. The structure contains 9450 tons of structural steel, fabricated and erected by the American Bridge Co., and 2200 tons of cable wire and suspender ropes manufactured by the American Steel & Wire Co., also 750 tons of castings and railings. Some of the castings were made by the Wheeling Mold & Foundry Co., Wheeling, W. Va.

Although ground for the bridge was broken in 1925, the American Bridge Co. did not start work until April 22, 1929; the work was completed Aug. 18, an unusually short period for a structure of this kind. The bridge was built for the New York Department of Public Works at a total cost of $6,500,000. The main span, 1500 ft. long, is the seventh longest suspension span in the world, and two side spans, each of 750 ft., give a total length of 3000 ft. The two main cables, 16¾ in. in diameter and about 3286½ ft. long from anchorage to anchorage, weigh 4,425,000 lb., including cable bands and wrapping wire, and are composed of about 3875 miles of No. 6 galvanized cold-drawn steel wire, having a 27,000,000 lb. modulus of elasticity and a specified ultimate strength of 215,000 lb. per sq. in. Each cable has a maximum working load of 12,000,000 lb. and is made with 6080 parts of parallel endless straight wires in 19 strands 3⅞ in. in diameter, each forming at each end a loop pin connected to an anchorage eyebar. The towers, 280 ft. high, are made chiefly of silicon steel.

Seasonal Improvement Expected in Europe

French Find Labor Scarce—German Machine Tool Exports Growing—British Report on Industry May Not Be Made Public

(*By cablegram*)

LONDON, Aug. 25.

GENERAL business depression continues, but signs of seasonal improvement are expected, beginning next month. There is a rather better feeling in steel circles, though orders are urgently needed and current bookings are poor. The Dowlais steel works will reopen in September after a two-month shut-down from lack of orders.

In pig iron the situation is almost unprecedentedly unfavorable, particularly in the Cleveland district, where the local holidays have deepened the depression. There have been further receipts of Indian pig iron in Scotland.

Continental steel is competing keenly in the English Midlands with local material.

It is considered unlikely that the Government will publish the report of the Sankey committee on the situation in the British iron and steel industry. It is believed that it recommends large-scale amalgamations and modernization of plants. Trade union representatives have urged that the workers' interests be safeguarded in cases where rationalization is attempted.

Unemployment in Britain now exceeds 2,000,000 persons.

Tin plate markets are still rather quiet, but prices are steady. Takings of tin plate by importing countries so far this year have been well maintained, indicating that this market was little affected by the world-wide slump. The August output was curtailed, owing to a stop-week and the closure of some mills to keep their output from exceeding their allotted quotas.

Galvanized sheet markets are dull, but, though most makers are working at only a fraction of their capacity, it was decided at the meeting last week to leave prices unchanged.

Demand for black sheets is meager, but prices are stable.

German Metal-Working Machinery Exports Reached New High in First Half, with France and Russia Foremost Customers.

* * *

Continental Selling Cartel for Semi-Finished Steel and Beams Fails to Maintain Prices.

* * *

Antwerp Office Building, a New European Skyscraper, Is 28 Stories in Height.

* * *

Japanese Exporters of Galvanized Sheets Plan Association to Control Growing Far Eastern Business.

* * *

Sankey Report on British Steel Industry May Not Be Made Public.

Improvements to cost £2,500,000 ($12,165,000) are being undertaken by the London, Midland and Scottish Railway.

A contract with the Portuguese Government has been made by Gruen & Bilfinger, Mannheim, Germany, providing for extensions to Lobito harbor, to cost 4,000,000m. ($952,000).

Continental iron and steel circles are confused and prices are easy, with meager demand. Semi-finished steel is quoted nominally higher than some sections in finished steel. Collapse of the sales offices handling the former is predicted.

There has been a slight revival in the German domestic market, but the works are still employed at a rate which is unsatisfactory. Pig iron stocks at furnaces, at end of June, stood at 770,500 tons (metric), the highest level since before the World War.

German blast furnace owners again are attempting to obtain reductions in deliveries of iron ore under contract from Swedish mines.

In Belgium, Arbed (Acieries Reunies de Burbach-Eich-Dudelange) and Socobelge (Société Co-operative Belgique) have arranged to undertake the sale of the products of the biggest Belgian wire plants outside the Clouteries de la Paix, thus accelerating the proposed reestablishment of the Belgian and Continental wire syndicates.

German output in July included 771,000 metric tons of pig iron and 906,000 tons of raw steel.

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at $4.8665 (par)

British Prices f.o.b. United Kingdom Ports

Ferromanganese, export	£11	10s.				$55.95		
Billets, open-hearth	5	17½	to	£6	5s.	28.46	to	$30.41
Black sheets, Japanese specifications	12	5				59.61		
Tin plate, per base box	0	18	to	0	18⅛	4.37	to	4.39
						Cents a Lb.		
Steel bars, open-hearth	7	15	to	8	5	1.69	to	1.79
Beams, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Channels, open-hearth	7	12½	to	8	12½	1.66	to	1.87
Angles, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Black sheets, No. 24 gage	9	10	to	9	15	2.06	to	2.12
Galvanized sheets, No. 24 gage	11	17½				2.57		

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£2	14s.	to	£2	15s.	$13.14	to	$14.39
Billets, Thomas	4	7				21.17		
Wire rods, low C., No. 5 B.W.G.	6	2	to	6	4	29.69	to	30.19
Rails, light	6	0				29.20		
Black sheets, No. 31 gage, Japanese	11	5	to	12	12	54.68	to	58.32
						Cents a Lb.		
Steel bars, merchant	4	5	to	4	7	0.94	to	0.96
Steel bars, deformed	4	10	to	4	11	0.99	to	1.00
Beams, Thomas, British standard	4	18	to	5	0½	1.09	to	1.11
Channels, Thomas, American sections	5	12	to	5	14	1.24	to	1.26
Angles, Thomas, 4-in. and larger, over ¾-in. thick	4	9	to	4	10	0.98	to	0.99
Angles, Thomas, 3-in.	4	5	to	4	6	0.94	to	0.95
Hoop and strip steel over 6-in. base	5	0	to	5	2½	1.10	to	1.12
Wire, plain, No. 8 gage	6	0	to	6	12½	1.32	to	1.46
Wire, barbed, 4-pt. No. 12 B.W.G.	10	0	to	11	0	2.21	to	2.43
Wire nails, base	6	2½	to	6	12½	$1.35	to	$1.46
						a keg		

German Machine Tool Exports Gain

HAMBURG, GERMANY, Aug. 13.—In the past few years German exports of machine tools have steadily increased, rising from 32,807 metric tons in the first half of 1926 to 65,770 tons in the first half of this year. The total value of exports in the first six months of this year was 115,600,000 m. ($28,468,800). The principal customer in the first half of this year was France, taking 10,547 metric tons of machine tools and other metal-working machinery, compared with only 3834 tons in the first half of last year. Russia was second among Germany's customers, with 7185 tons in the first half of this year, compared with 3799 tons in the same period of 1929.

Other customers, such as Great Britain, Belgium, Italy, Czechoslovakia and Argentina showed moderate increases in the tonnage of machine tools taken this year, and exports to the United States advanced from 1078 tons in the first half of last year to 1136 tons this year. Exports of metal-working machinery and machine tools have declined to Japan, Poland and Spain. The Japanese took only 416 tons in the first half of this year, compared with 1512 tons in the first half of 1929; Poland's imports declined from 1619 tons to 503 tons this year, and Spain took 1143 tons in the first half of this year, compared with 1358 tons last year.

Continental Plate Makers May Form Cartel

HAMBURG, GERMANY, Aug. 13.—Negotiations have been instituted for the formation of a cartel to include all Continental export sellers of open-hearth boiler and ship plates. As the German producers and sellers already have a national cartel and the number of sellers of open-hearth plates in other European countries is decidedly limited, no special difficulty is expected in forming the new association. British producers have been approached with an invitation to join, but are not expected to accept.

French Labor Scarcity in Equipment Plants

BORDEAUX, Aug. 4.—French railroad equipment companies have a capacity to build 1200 locomotives yearly, but the labor available allows for undertaking only 500. Similarly, against a capacity of 1800 coaches and 32,000 freight cars, the labor supply is put at sufficient for only 1400 and 22,000.

To overcome this obstacle endeavors are being made to introduce foreign workmen, particularly from Roumania. Wages now exceed the rise in the cost of living by 20 per cent.

On the other hand the average price of the locomotives sold to the French railroads in 1929 was 16.7c. a lb., as against 3c. in 1912-14. For the tenders the average price was 7.1c., compared with 1.35c., and for the freight cars the average price was 6.2c. against 1.1c., a co-efficient of 5.8.

Beam Prices Sag Despite Cartel Control

DÜSSELDORF, GERMANY, Aug. 13.—The expected lack of authority by the selling cartel to maintain prices for semi-finished material and beams is beginning to be apparent. With individual mills selling directly, the agreed price of £4 16s. a metric ton (1.06c. a lb.) for beams of ordinary specifications, and £4 18s. a ton (1.08c. a lb.) for British sections has been shaded by 1s. to 1s. 6d. (24c. to 36c.) a ton in the past week.

Japan's Galvanized Sheet Exports Grow Steadily

YOKOHAMA, JAPAN, July 28.—Exportation of galvanized sheets by Japanese producers continues to grow, despite depression in other branches of the iron and steel industry. There is a steady movement of sheets to 42 ports in South China and the Dutch East Indies and to 96 places in British India and the Philippines.

Growth of this trade in galvanized sheets is attributed by producers here to a general improvement in quality in recent years, lower prices than those of Continental and American sellers, about 20 sen (10c.) a sheet, and lower freight rates to the Far Eastern consumers. Formation of a selling association is being discussed by the Japanese producers, which it is believed would enable them to advance the export price by about 10 sen (5c.) a sheet and still undersell the foreign makers.

Further Dismissals by Locomotive Shops

HAMBURG, GERMANY, Aug. 13.—Continued depression in the locomotive business has brought the dismissal of 1300 more workmen since the first of the month. Mergers and liquidations among German locomotive builders has reduced the number of shops to 12, compared with 21 in 1925.

On Tariff Commission

WASHINGTON, Aug. 26.—President Hoover today announced the appointment of Thomas Walker Page to be a member of the Tariff Commission. Mr. Page, Democrat, from Virginia, was former chairman of the commission. He will take office upon expiration of the term of the present commission, Sept. 16.

Dr. Page, who was educated in this country and abroad, held chairs of economics in the Universities of California and Texas, was at one time president of the National Tax Association and is chairman of the Council of the Institute of Economics, Washington. He is 64 years of age.

Fletcher Is New Chairman of Tariff Commission

WASHINGTON, Aug. 26.—Henry P. Fletcher, Greencastle, Pa., who has been appointed by President Hoover as chairman of the Tariff Commission, to be reorganized under the Hawley-Smoot act, is looked upon by the President as being well qualified for the position. The President pointed out that the long experience of Mr. Fletcher in the diplomatic service has "entailed careful analysis of economic, trade and financial problems in connection with the United States in all parts of the world."

There remain five other appointments to the commission, to be made by Sept. 16. It is reported, however, that two of the present members, Chairman Edgar B. Brossard of Utah and Alfred P. Dennis of Maryland, will be reappointed.

Mr. Fletcher was born in Greencastle in 1873 and was educated at Chambersburg Academy, Chambersburg, Pa., and at Lafayette College, Easton, Pa. He practiced law until 1898, when he joined the Roosevelt Rough Riders in the Spanish-American War. He served also during the Philippine insurrection.

Entering the foreign service in 1902, Mr. Fletcher became secretary at Havana, then at Lisbon, and next at Peking. In 1909 he was appointed minister to Chile, and later was ambassador to that country. He served as ambassador to Mexico from 1916 to 1920, resigning to become Under-Secretary of State. He went to Belgium in 1922 as ambassador and later served in that capacity in Italy, resigning in 1929.

Steel Castings Orders in July at 40 Per Cent

WASHINGTON, Aug. 26.—Orders for commercial steel castings in July totaled 57,923 net tons, or 40 per cent of capacity, against 61,358 tons, or 43 per cent of capacity, in June, according to the Department of Commerce. Production dropped to 79,029 tons, or 55 per cent of capacity, from 90-985 tons, or 63 per cent of capacity.

In the first seven months of 1930, orders aggregated 642,901 tons, or 64 per cent of capacity, compared with 827,290 tons, or 81 per cent of capacity, in the corresponding period of last year. The output in the first seven months of the current year was 717,089 tons, or 71 per cent of capacity, against 787,594 tons, or 77 per cent of capacity, in the corresponding period of 1929.

July orders consisted of 14,708 tons of railroad specialties, representing 22 per cent of that class of capacity and 43,248 tons of miscellaneous castings, or 56 per cent of such capacity. The production in July consisted of 26,060 tons of railroad specialties or 39 per cent of that class of capacity and 52,969 tons of miscellaneous castings, or 68 per cent of such capacity.

Low and High Alloy Steel Castings Have Many Uses

(*Concluded from page* 549)

classified according as their special properties are mechanical, physical or chemical.

Probably the best known in the first class is the 12 per cent manganese steel, most resistant to wear. The highly alloyed chromium-tungsten steels, in addition to being wear-resistant, have also the property of being difficult to cut with a torch, so that they are much used for burglar proof safes. They are not particularly tough. The self-hardening steels include the alloys of chromium, cobalt, and either tungsten or vanadium. The tungsten alloy shows great abrasion resistance at high temperatures, and is much used in tube mills and wire-drawing apparatus.

As instances of special physical properties may be mentioned the non-magnetic steels, including the 12 per cent manganese alloy. This is also a very poor conductor, so that it is well suited for electrical construction. An alloy with 23 per cent Ni and 1.5 per cent Cr serves the same purpose, and, furthermore, is more easily worked than the manganese steel.

V2A Steels Are Very Tough and Flexible

Among the chemically inert steels, the most widely used is known as V2A. This is an austenitic steel, of low elastic limit, but exceedingly tough and flexible. It is nearly non-magnetic, and cannot be hardened. It is not attacked by oxygen of the air or by oxidizing acids, if not at too high a temperature. As is well known, the corrosion resistance of V2A is due to the chromium. The position of V2A in the electromotive series of the metals is just below that of silver.

Certain Iron-Chromium Alloys Are "Noble"

Iron-chromium alloys are "noble" if the chromium content is above 14 per cent, and if the chromium is in the passive condition. Since the latter condition is not generally met, the steels are slightly less resistant to strong non-oxidizing acids, such as H_2SO_4 and HCl. Inertness in these cases may be somewhat increased by incorporating in the alloy small amounts of other metals, notably molybdenum. Obviously the largest use of these steels is in the chemical industry.

Two Main Classes of Heat-Resistant Castings

In the field of heat-resistant alloys, two main classes may be distinguished: First, those which contain chiefly chromium, and second, those which are built up from a nickel-chromium base. The former may be used up to 1050 deg. C, where strength is not a factor, and are sometimes to be preferred on account of greater chemical inertness. The second class shows a fairly high strength even at 1200 deg. C, but cannot be used in a sulphur-bearing atmosphere. These steels are chiefly used in construction of furnaces and kilns.

Difficulties in Casting These Alloys

CERTAIN difficulties arise in casting alloy steels which are not met in the case of ordinary materials. In the first place, the tendency of chromium to oxidize, forming a film on the liquid, makes it easily possible for the oxide to be entrapped in the casting. Another factor which necessitates special care in casting is the high viscosity of high-chromium alloys and their tendency to sudden freezing, particularly true of the low-carbon types. On this account they must be cast at a fairly high temperature.

The use of a high casting temperature is, from several other points of view, undesirable. For it is attended by excessive absorption of gas, abnormally high shrinkage and enlarged grains in the casting. Good practice is to use a very porous and refractory sand, lightly drying the surface, pouring as rapidly as possible, and arranging chills to accelerate cooling of the heavier sections.

It is to be noted that, since the steels are austenitic, no refinement of the grain is possible through heat treatment. Certain alloys, particularly the plain chromium steels, are exceedingly brittle after cooling in the mold. These may be saved by allowing them to cool only to a dull red, and then annealing to remove the strains.

Produces Bars and Bands at 2000 Ft. a Minute

(*Concluded from page* 559)

ing to the requirements of the material being rolled.

A flying shear is installed after the No. 7 stand to crop the front ends of the billet. A Rendleman flying shear has been installed after stand No. 15.

The mill will have a finishing speed of 2000 ft. per min. The operator's pulpit faces the line of stands and the motor-room is behind them.

Material from the final stand is delivered to a Treadwell hotbed. This is a double bed of the escapement-type with provision for the continuous stacking of flats for annealing. The mill runout-table and the hotbed receiving table are equipped with individual motor-rollers. The two hotbed runout-tables deliver finished material to the shears, where comprehensive gaging equipment insures shearing of the material to accurate lengths.

The electric controls for the hotbed and the tables are installed in a room below the floor. This arrangement leaves the mill remarkably free of obstructions.

As an alternative to the movement described above, the material from the stands may be delivered instead to coilers off to one side, thence to a cooling conveyor 800 ft. long. This terminates at the shipping end of the building. There are facilities also for unloading material from the conveyor to trucks where it is weighed before shipping. An electric transfer-table capable of handling material 70 ft. long makes it possible to transfer finished material to or from the adjoining 14-in. merchant mill.

Finally, the new mill is equipped with two 15-ton shipping cranes with 100-ft. span and traveling cages. A third similar crane handles billets to the furnace.

Industry Opposes Manganese Embargo

Thomas J. Doherty, Representing Institute, Appears in Case—American Mines Reported to be Closed

WASHINGTON, Aug. 26.—Conclusive evidence of dumping of manganese ore into the United States market from Russia must be established before the Treasury Department can suspend entries of the shipments, Assistant Secretary of the Treasury Seymour Lowman stated at the hearing here last Thursday, which was based on a petition of the American Manganese Producers' Association. The association charges that the Russian ore is being dumped into the United States at prices which domestic producers cannot meet, with the result that American mines are closed down.

The testimony given at the hearing, so far as the charge of the petition is concerned, was largely of a general character, but J. Carson Adkerson, president, American Manganese Producers' Association, asked for and was given permission to file confidential data with the Treasury to prove that the Russian ore is being dumped.

The hearing will be resumed in Washington on Sept. 9, when evidence on behalf of the iron and steel industry will be given by Thomas J. Doherty, representing the American Iron and Steel Institute and by A. C. Bickford, attorney for the Amtorg Trading Corporation.

Ore Higher Than Before War

Mr. Doherty said it will be shown that prices paid by the American industry for Russian ore are as high as those paid for manganese ore from other countries. He also stated that the price of manganese ore, unlike prices of other metals, is higher at present than before the war. He suggested that the Treasury Department make a careful inquiry into the situation and expressed the hope that it would send its agents to American iron and steel plants to get evidence as to prices paid. Mr. Doherty stated that there is no need of suspending imports since the depressed condition in the steel industry is curtailing use of manganese ore, which he described as a "drug on the market."

The substance of the testimony by domestic producers was that they were building up an industry, but were forced to close down their plants by reason of Russian importations. Mr. Adkerson said that the first of the year the domestic industry was producing at the rate of 200,000 tons of high-grade ore annually, and that if protected against dumping would build the capacity up to a point where it would meet the annual requirements of the entire steel industry, which he placed at about 750,000 tons of ore.

American Producer Loses Money

Harold Pumpelly, vice-president, Manganese Development Co., with plant at Butte, Mont., told of research work that has been done through cooperation with the Bureau of Mines and the Anaconda Copper Co., resulting in investing $300,000 for beneficiating ore. He said that encouragement was given by several steel companies, and that in March, 1928, the company's plant went into production, predicating the market on a five-year average of 65c. to 68c. a unit. One steel company, he said, made a contract for 4000 tons, 2000 tons to be shipped to one and 2000 tons to another plant at 60c., delivered. After about 450 tons had been shipped to one plant, Mr. Pumpelly said, an order was received to cancel further shipments to it and to ship the remainder to the other plant. After completing shipment of the 4000 tons, he said, he went to the company and told it that no more ore could be furnished at 60c. because the cost of production was more than had been anticipated.

However, he said, his company continued shipping at this figure up to 12,000 tons when shipments were stopped, and it was found the company had lost about $50,000 on the "experiment." Then the company, he said, was able to reduce costs on raw material, get freight rate adjustments and make several improvements in operations, but never has been able to ship at a higher price than 61c. a unit, with the result that $60,000 was lost on its entire operations.

Mr. Pumpelly said that the Russian ore ranges from 48 to 52 per cent in manganese, with an average of about 50 per cent, while his company's ore was 57 per cent manganese. Since a flotation process has been put in together with the beneficiating process, Mr. Pumpelly said the ore will run 62 per cent. He added that his company is ready to produce 70,000 tons of high-grade ore a year and can sell in competition with Russian ore at 47c. The petition of the manganese association charges that Russian ore is being sold on the Atlantic seaboard at about 25c. a unit.

Says Mines Are Closed

Mr. Adkerson, in replying to a question by Mr. Lowman during the testimony of Mr. Pumpelly, said that six major producing companies and 25 undeveloped mines are closed down in the domestic industry with no important production under way.

Mr. Clark said that the Chapin Exploration Co. was proposing to build a plant at Las Vegas, but could not operate at present prices. Dealers, he said, had told him that the most they could pay was 47c. a unit, including the duty. His company's property, according to Mr. Clark, could produce 200,000 to 250,000 tons of manganese annually if its plant were built and able to operate. He read a statement from a Russian publication saying labor in Russian manganese ore mines is paid $43 a month. Other manganese producers gave evidence of a character similar to that of Mr. Adkerson, Mr. Pumpelly and Mr. Clark. W. C. Roberts, American Federation of Labor, asked that the Russian ore imports be suspended and pointed to the fact that American labor had been thrown out of employment through the closing down of domestic mines.

Mr. Bickford asked for time to present the case for the Amtorg Trading Corporation, and said he would be prepared to present evidence tnat the Russian product is not being dumped into the United States.

Canadian Copper Combination

TORONTO, Aug. 25.—W. H. Marsh, vice-president, Canada Wire & Cable Co., Ltd., and James Y. Murdoch, president of Noranda Mines, Ltd., have announced that Noranda has acquired a substantial interest in the former company. It means that Noranda has found a market through the Canada Wire & Cable Co.

The official announcement is as follows: "Plans have been consummated whereby Noranda Mines, Ltd., has acquired a substantial share interest in the Canada Wire & Cable Co., Ltd. James Y. Murdoch, Toronto, and Noah A. Timmins, Montreal, president and director, respectively, of Noranda Mines, have been elected to the board of directors of Canada Wire & Cable Co. Canada Wire & Cable will shortly commence the construction of a rod mill and wire drawing plant adjacent to the copper refinery now being erected at Montreal East by the Canadian Copper Refiners, Ltd., the Noranda refinery subsidiary.

In April, 1929, Canada Wire & Cable acquired all the outstanding capital stock of the Standard Underground Cable Co., Hamilton.

Steel Shipments on Ohio River Gain

Shipments of steel products on the Ohio River in the Pittsburgh district during July amounted to 147,558 net tons, according to the United States Engineer Office, Pittsburgh. This is an increase over June shipments, which totaled 144,099 tons, and over the corresponding shipments of the same month one year ago, which were 102,051 tons.

River steel shipments on the Monongahela River last month were 132,161 tons, compared with 137,603 tons in the preceding month and with 109,051 tons in July, 1929. On the Allegheny River 1125 tons of steel was moved in July, compared to 700 tons in June and 25 tons in July, 1929.

Yoder Co., Cleveland, has moved to West 55th Street and Walworth Avenue.

Machinery Markets and News of the Works

Sentiment Better

Machine Tool Business Still Slow, But Inquiries Reflect More Interest in New Equipment

IN most districts orders for machine tools increased slightly. The change for the better is more marked perhaps because of the extreme dullness of recent weeks. Furthermore, a better sentiment, based on several factors, such as the more serious tone of inquiry and the more substantial interest reported by salesmen, seems to have set in.

Prominent in the business of the week were purchases by the Majestic Household Utilities Corporation, Chicago. Agricultural implement makers have also been in the market, and several orders for punch presses have been placed.

An inquiry for ten tools for a service station has been issued by the Westinghouse Electric & Mfg. Co.

New York

NEW YORK, Aug. 26.—For the first time since June a slight degree of improvement seemed to be apparent in the machine tool trade. In view of the fact that the stagnation of the past two months makes any gain, however small, stand out in bold relief, the slight change for the better in the past week could easily be overemphasized, but at least it has given machine tool sellers encouragement that the worst is over and that September may bring an upturn that can definitely be measured. Some sales offices which have virtually had no orders for many weeks had a volume of business that looked promising when compared with recent low records.

The American Locomotive Co. placed orders for several machines for Schenectady and Auburn, N. Y., the plant at the latter place being that of its subsidiary, the McIntosh & Seymour Corporation. An inquiry for 10 tools, the largest in some time, was received by the trade from the Westinghouse Electric & Mfg. Co., East Pittsburgh, for equipping a service station in Newark. There were also miscellaneous inquiries for single tools and some signs of life on prospective purchases which have been pending for months. Moreover, machine tool salesmen report a little more interest among companies whose doors have virtually been closed during the summer to all discussion of machine tool buying.

General Electric Co., Schenectady, N. Y., has plans for an addition to branch works at Fort Wayne, Ind., to cost over $200,000 with equipment. E. A. Barnes is superintendent at Fort Wayne Works.

New York Central Railroad Co., 466 Lexington Avenue, New York, has filed plans for an automobile service, repair and garage building in connection with an eight-story storage and distributing plant, 200 x 267 ft., on West End Avenue, from Sixty-fourth to Sixty-fifth Street, to cost $1,400,000 with equipment. DePace & Juster, 151 West Forty-sixth Street, are architects.

Union Carbide & Carbon Corporation, 30 East Forty-second Street, New York, has acquired property at Chattanooga, Tenn., for erection of two new plants for its subsidiaries, Prest-O-Lite Co., and Linde Air Products Co., for production of acetylene apparatus, welding equipment, etc., and commercial oxygen, entire project to cost over $400,000 with machinery.

Morris Feltzin, 191 Lewis Street, New York, manufacturer of automobile bodies, has filed plans for a new one-story unit, 45 x 82 ft., primarily for automobile repairs, to cost close to $24,000 with equipment. Jacob Fisher, Bible House, is architect.

A three-story automobile service, repair and garage building, with capacity of 150 motor buses at one time, will be built by New York Avenue Holding Co., care of Murray Klein, 65 Court Street, Brooklyn, architect, in connection with new motor bus terminal at Jamaica, L. I., to cost $1,500,000 with equipment. Structure will be occupied by Bee Line, Inc., Jamaica, operating a motor bus system. Architect noted is in charge.

American Can Co., 230 Park Avenue, New York, has approved plans for a new two-story plant at Seattle, to cost over $500,000 with machinery. Company is now operating branch in that city.

Atlantic Broadcasting Co., operating Columbia Broadcasting System, Inc., 485 Madison Avenue, New York, has applied for permission to build new broadcasting plant of 50,000-watt capacity in Wayne Township, Passaic County, N. J., including steel towers, power station and other equipment, to cost over $300,000.

Vacuum Oil Co., 61 Broadway, New York, has purchased White Star Refining Co., 903 West Grand Boulevard, Detroit, operating oil refineries at Trenton, Mich., and Wood River, Ill. Purchasing company will continue operations at refineries and plans expansion.

J. Black, 246 Central Avenue, Newark, operating an automobile radiator works, has awarded general contract to State Builders, Inc., 24 Commerce Street, for a new two-story shop, to cost about $40,000 with equipment. M. Arthur Wolf, 845 Broad Street, is architect and engineer.

North Ward Radio Co., 367 Plane Street, Newark, local representative for Majestic radio equipment and electric refrigerators, has taken title to one-acre tract on Frelinghuysen Avenue, as site for new factory branch, storage and distributing plant, two stories, 150 x 250 ft., to cost over $75,000 with equipment. William E. Lehman, 972 Broad Street, is architect.

John C. Kohaut, Inc., 117 Green Street, Newark, operating a mechanical and wood-turning works, has asked bids on general contract for a new three-story plant, 50 x 100 ft., to cost over $70,000 with equipment. Present plant will be removed to new location. Marshall N. Shoemaker, 15 Central Avenue, is architect and engineer.

United States Metals Refining Co., Carteret, N. J., has begun construction of one-story addition, to cost about $35,000 with equipment. Headquarters are at 61 Broadway, New York.

American Goetze Gasket & Packing Co., Allen Avenue, New Brunswick, N. J., manufacturer of gaskets, power plant packing, etc., has awarded a general contract to Joseph Goodfriend, Middletown, N. J., for a one-story top addition, to cost over $25,000 with equipment. Harry G. Bach, 63 Schureman Street, New Brunswick, is architect.

Ruberoid Co., Bound Brook, N. J., manufacturer of roofing specialties, has arranged for purchase of controlling interest in Eternit, Inc., 9215 Riverview Drive, St. Louis, manufacturer of asbestos-cement shingles, corrugated sheets and other kindred building products, and will operate as a subsidiary. Headquarters of purchasing company are at 95 Madison Avenue, New York.

Brunner-Winkle Aircraft Corporation, 17 Haverkamp Street, Glendale, L. I., manufacturer of airplanes and parts, is arranging for change of company name to Bird Aircraft Corporation. James M. Phelan is secretary and treasurer.

New England

BOSTON, Aug. 25.—New tool dealers now report that July was the leanest month experienced in many years. It is felt that August has marked a turning point in business, but the net gain over July will be comparatively small. Sales the past week included $7,000 worth of shop equipment for an eastern Massachusetts school, two lathes and a planer

for the Pneumatic Drop Hammer Co., Boston, $2,627 worth of low-priced lathes for a Boston school, two tool grinders for two greater Boston shops, and miscellaneous small equipment for Massachusetts and Vermont companies.

The feature of the market is the sizable value of tools pending, requisitions for which have been made out and are awaiting the attention of executives after Labor Day. One local dealer has at least an aggregate of $250,000 worth of tools under negotiation, without competition, and other prospects. Other houses also have negotiations under way involving smaller amounts. A marked improvement in machine tool buying is looked for provided general business conditions warrant. Buying of used tools is largely confined to lathes of low and moderate cost, with an occasional milling machine and small drilling equipment.

Sales of small tools this month will be larger than anticipated, but business is only fair.

A hand operated crane and air blowers are required for Portsmouth, R. I., navy yard power pant.

George H. Armitage, Jefferson Avenue, Hillsgrove, R. I., has plans for a one-story and basement airplane manufacturing plant, 60 x 80 ft., at Warwick, R. I.

Fyams, Fraser & Blackway Co., Warren, R. I., machinist, has plans for a shop and storage plant.

Granville Brothers Aircraft Corporation, 1211 Liberty Street, Springfield, Mass., is considering erection of a manufacturing plant.

A. G. Kimball, president, Landers, Frary & Clark, New Britain, Conn., Richard L. White, treasurer, and Henry T. Burr, secretary, have organized a company to manufacture vacuum or insulated bottles, containers and other articles.

Torrington Castings Co., New Litchfield Street, Torrington, Conn., has awarded general contract to Longhi Construction Co., 42 Calhoun Street, for rebuilding of plant recently damaged by fire, to cost over $25,000 with equipment.

Howard Co., New Haven, Conn., manufacturer of building brick, is planning to rebuild part of plant recently destroyed by fire, with loss of over $100,000, including two large brick-making machines and other equipment.

Vermont Marble Co., Proctor, Vt., has plans for a new one-story fabricating shop, 240 x 280 ft., for cutting, trimming, polishing, etc., at Center Rutland, Vt., to cost over $200,000 with equipment. Conveying and other mechanical-handling equipment will be installed. E. Belcher is company engineer.

RCA-Victor Corporation, Woolworth Building, New York, a subsidiary of Radio Corporation of America, same address, has awarded general contract to Turner Construction Co., 178 Tremont Street, Boston, for new two-story and basement assembling plant, 80 x 260 ft., at Jamaica Plain, Boston, to cost over $100,000 with equipment. Monks & Johnson, 99 Chauncy Street, Boston, are architects and engineers.

Scott & Williams, Inc., Laconia, N. H., manufacturer of knitting machinery and parts, is arranging for immediate occupancy of new four-story and basement plant unit, 63 x 480 ft., recently completed.

Boston & Maine Railroad Co., North Station, Boston, has awarded general contract to H. L. Hauser Building Co., 263 Summer Street, for one-story building at shops at Billerica, Mass., for sand-blast operations, to cost over $35,000 with machinery.

Board of Education, Middletown, Conn., will install manual training equipment in new three-story high school to cost about $260,000, for which bids will be asked on general contract early in September. Towner & Sellew Associates, Inc., Middletown, is architect.

South Atlantic

BALTIMORE, Aug. 25.—Republic Service Corporation, 15 North Third Avenue, Coatesville, Pa., operating electric light and power properties in Pennsylvania and Virginia, is planning new hydroelectric power development on South Fork of Shenandoah River, near Overall, Va., with initial capacity of about 4500 kw., to cost over $700,000 with transmission system. William C. Whitner & Co., Inc., Electric Building, Richmond, Va., is engineer.

Gulf Refining Co., Frick Annex, Pittsburgh, a subsidiary of Gulf Oil Corporation, same address, has acquired property fronting on James River, Richmond, Va., as site for new oil storage and distributing plant, with wharf and dock facilities for tanker unloading, to cost over $100,000 with equipment.

South Mineral Products Co., Lowesville, Va., has work under way on a new mining and refining plant on local mineral lands, to cost over $1,000,000 with machinery. Stone & Webster Engineering Corporation, 49 Federal Street, Boston, is engineer and contractor.

General Purchasing Officer, Panama Canal, Washington, is asking bids until Sept. 9 for gasoline engine, car wheels, rigid steel conduit, dragline scraper, cable, wire and other electrical and mechanical equipment for canal zone.

Southern Public Utilities Co., 426 South Church Street, Charlotte, N. C., is considering construction of a new artificial gas-manufacturing plant at Chester, S. C., to cost close to $100,000 with machinery.

Kingan & Co., West Maryland Street, Indianapolis, meat packer, has plans for a new branch plant at Atlanta, Ga., to cost over $75,000 with equipment.

Service Ice & Storage Co., Nichols Street and Albany Avenue, Waycross, Ga., has been acquired by new interests headed by Charles T. and A. M. Dixon, Waycross, who will reorganize company. New owners are considering extensions and improvements, including installation of additional equipment.

Bureau of Yards and Docks, Navy Department, Washington, is asking bids (no closing date stated), for three turbo-generator units, each of 500-kw. capacity, for installation at naval stations at Pensacola, Fla., Great Lakes, Ill., and Portsmouth, N. H., respectively.

Atlanta Metallic Casket Co., 216 Elliott Street, Atlanta, Ga., has awarded a general contract to Flagler Co., Red Rock Building, for a two-story and basement addition, to cost about $25,000 with equipment.

Better Products Machinery Co., Inc., Lynchburg, Va., care of John B. Winfree, Jr., 1007 Federal Street, recently organized by Mr. Winfree and associates, plans operation of local factory for manufacture of special machinery and equipment.

Western Maryland Railroad Co., Baltimore, plans rebuilding part of grain elevator at Port Covington, destroyed by fire Aug. 20, with loss close to $200,000 including equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Sept. 9 for one 8-ton hand-operated crane, for Hampton Roads navy yard; until Sept. 2 for one motor-driven, universal milling machine, and one centrifugal vibration generator; until Sept. 9 for 10 portable electric pumps and spare parts.

Pittsburgh

PITTSBURGH, Aug. 25.—Machine tool dealers report no improvement in orders and considerable business which had been expected to materialize this month is being delayed. A number of plant executives are on vacations and many orders now held up are expected to be placed immediately after Labor Day. Single tools constitute the bulk of current bookings. The Westinghouse Electric & Mfg. Co. will close shortly on a few tools for which it has been inquiring.

A number of metal-working companies are said to be negotiating for plant sites in the Pittsburgh district. Among recent prospects is a maker of automobile lifts in Iowa.

Crucible Steel Co. of America, Inc., Oliver Building, Pittsburgh, has leased building to be erected by Ferro Realty Co., Cincinnati, at Detroit, to cost over $90,000, and will use for storage and distributing plant.

Viking Art Metal Co., Ridgway, Pa., is completing new factory for production of art metal goods, and will remove considerable equipment from Jamestown, N. Y., for installation.

Pressed Steel Car Co., Farmers Bank Building, Pittsburgh, has begun construction of new power plant at branch works at Hegewisch, near Chicago, to cost over $40,000 with equipment. Plans are under consideration for extensions in foundries at same plant.

Pittsburgh Terminal Coal Corporation, Wabash Building, Pittsburgh, has begun construction of a new mechanical coal-cleaning plant at its No. 8 mine, near Coverdale, Pa., to cost about $100,000 with machinery. Similar plants are contemplated at other mining properties.

H. J. Heinz Co., 1062 Progress Street, Northside, Pittsburgh, manufacturer of canned foods, has acquired property at Detroit, as site for new one-story factory branch, storage and distributing plant, totaling about 30,000 sq. ft. floor space, to cost about $65,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer. Heinz company is completing new branch canning plant at Medina, N. Y., to cost about $50,000 with machinery.

Following recent acquisition of Wiley Casket Co., Huntington, W. Va., by Acme Casket Co., R. & P. Building, Huntington, purchasing company has leased building at Fourth Avenue and Twenty-fourth Street, and will remodel for new plant.

City Council, Tarentum, Pa., is considering addition to municipal electric light and power plant to cost over $125,000, to include installation of a 1000-kw. generator unit and accessory equipment. Municipal Light and Water Department is in charge.

Construction work is under way on new hydroelectric and steam electric power plant developments of subsidiary companies of Union Carbide & Carbon Corporation, near Hawks Nest, Gauley Junction and Boncar, W. Va. Total capacity of two plants will be about 200,000 hp. Power output will be utilized by proposed plant of Electro Metallurgical Co. at Boncar.

Philadelphia

PHILADELPHIA, Aug. 25.—Sun Oil Co., 1608 Walnut Street, Philadelphia, has acquired 14 acres at South Amboy, N. J., with frontage of about 500 ft. on Raritan River, and plans new terminal for oil storage and distribution, including docks and equipment for unloading tankers, to cost over $100,000.

American Pipe & Supply Co., Vandalia and Portland Streets, Philadelphia, has awarded general contract to Southern Construction Co., Sixty-ninth and Market Streets, for one-story addition for storage and distribution, to cost about $24,000 with equipment.

Albert Kingsbury, 4324 Tackawanna Street, Philadelphia, manufacturer of metal bearings, etc., has awarded general contract to S. D. Milner, 4616 Frankford Street, for a one-story addition, including improvements in present factory, to cost about $35,000.

MacBeth Arc Lamp Co., Inc., 1705 Vine Street, Philadelphia, manufacturer of lighting equipment, has leased a floor in mill at Twenty-eighth and Parrish Streets, for expansion.

Servicised Products Corporation, 53 West Jackson Boulevard, Chicago, manufacturer of building materials, has purchased former plant of Trexler Co., South Wilmington, Del., originally occupied by Standard Arms Mfg. Co. and Artillery Fuse Co., and will remodel for new manufacturing plant for Eastern trade. It is expected to have plant ready for production in November. Company will open temporary local offices in Chamber of Commerce Building, with E. O. Seeley, vice-president, as local manager. Mr. Seeley will be in charge of new plant.

Hobart Mfg. Co., Troy, Ohio, manufacturer of meat choppers, etc., has leased floor in building at 1334 Spring Garden Street, Philadelphia, for local factory branch and distributing plant.

South Montrose Mfg. Co., Montrose, Pa., manufacturer of garment hangers and kindred hardware specialties, wire goods, etc., is planning to rebuild part of plant destroyed by fire Aug. 21, with loss more than $40,000 including equipment.

Raup Machinery Sales & Service, Inc., Harrisburg, Pa., care of Sterling G. McNees, Payne-Shoemaker Building, Harrisburg, attorney, is being organized by local interests to operate a plant for manufacture and repair of lawn mowers and other garden and agricultural tools and equipment.

Pennsylvania Power & Light Co., Allentown, Pa., has applied for permission to purchase Buffalo Union Power & Light Co. and East Buffalo Union Power & Light Co., and will consolidate. Purchasing company plans expansion in new territory, including transmission lines.

Buffalo

BUFFALO, Aug. 25.—Scott Pump Co., 645 Atlantic Avenue, Rochester, N. Y., manufacturer of pumping machinery, drainers, etc., is considering new one-story branch plant at Niagara Falls, Ont., to cost over $30,000 with equipment.

J. P. Devine Mfg. Co., 1372 Clinton Street, Buffalo, manufacturer of vacuum drying equipment, chemical and oil plant machinery, etc., has purchased manufacturing and sales rights of Pratt vapor phase petroleum processing apparatus for production of anti-knock distillate, heretofore manufactured and installed by Automotive Distillate Corporation. Devine company will provide facilities for production at local plant for this branch of output.

Frank S. Oldham, 278 Locust Street, Lockport, N. Y., and associates have organized Cooker Saw Co., and plan early operation of local factory for manufacture of saws and kindred products. James Barrancotto, 440 Walnut Street, is interested in new company.

Department of Public Works, Municipal Building, Buffalo, George F. Fisk, commissioner, is asking bids until Sept. 4 for a hangar and administration building at marine airport; also for electric system and other work.

Syracuse Lighting Co., Syracuse, N. Y., a subsidiary of Niagara Hudson Power Corporation, Buffalo, has acquired property on Hiawatha Boulevard and plans erection of new artificial gas plant, to cost over $1,500,000 with equipment, including storage facilities for a capacity of 10,000,000 cu. ft.

International Nutyp Tool Corporation, Oswego, N. Y., a new corporation, has acquired Oswego Tool Co., Oswego, manufacturer of wrenches, tube expanders, vises, pipe cutters and screw punches. Expansion of plant is under consideration and new lines of manufacture may be added. H. W. Stone, formerly president of U. S. Hoffman Machinery Corporation, New York, is president of new company; E. B. Russell, formerly head of the Security Finance Co., is vice-president and treasurer, and E. W. Fulton, who was works manager of Oswego Tool Co., is vice-president and works manager.

Carborundum Co., Niagara Falls, N. Y., has purchased abrasive division of American Glue Co. effective Aug. 8, and new organization will be known as Union Sand Paper Division of Carborundum Co. Manufacturing operations will be continued at Union plant at East Walpole, Mass., and at Brantford, Ont. Main office of Union Sand Paper Division will be maintained at 121 Beverly Street, Boston.

Detroit

DETROIT, Aug. 25.—Michigan United Light & Power Co., Ludington, has plans for a new electric generating plant on Boardman River, near Traverse City, to cost close to $350,000 including transmission system.

Metal Process Corporation, Detroit, has awarded a general contract to M. J. Hoffman Construction Co., Furniture Building, Evansville, Ind., for new one-story plant, 150 x 450 ft., to cost about $240,000 with equipment. Two electric traveling cranes with magnetic lifting devices will be installed in addition to other mechanical-handling equipment. Contracting company is in charge of work.

Power Carburetor Corporation, 7856 Cass Avenue, Detroit, recently organized by Charles R. Gates and associates, is planning operation of local plant for manufacture of carburetor equipment. Harry N. Miller is also interested in new company.

Pneumatic Tube Co., Detroit, has acquired additional property near plant on Brooklyn Avenue and plans expansion.

Burke Stoker & Mfg. Co., Holland, manufacturer of automatic stokers, parts, etc., has leased floor in building at 917-23 West Nineteenth Street, Chicago, totaling 10,000 sq. ft. floor space, for new plant. It is understood that operations will be transferred from Holland to new location. Company has recently been reorganized. Emil W. Ritter is president, and Samuel L. Arson, vice-president.

Hercules Powder Co., duPont Building, Wilmington, Del., has purchased about 300 acres near Port Huron, Mich., as site for new plant for production of nitro cellulose, to cost over $250,000 with equipment. Company engineering department, address noted, will be in charge.

Federal-Mogul Corporation, 11031 Shoemaker Street, Detroit, manufacturer of automobile bushings, bearings, etc., is arranging for an increase in capital from 150,000 to 180,000 shares of stock, no par value, for expansion. Company has recently acquired plants and business of Watkins Mfg. Co., with headquarters at Wichita, Kan., operating a chain of shops for rebabbiting connecting rods, and will develop this branch with establishment of new branches in other cities. Federal organization recently purchased Pacific Metal Bearing Co., San Francisco, and will operate as a subsidiary on Pacific Coast.

Franklin Glider Corporation, Ypsilanti, recently organized by R. E. Franklin, professor at University of Michigan, Ann Arbor, and associates, has leased former local plant of Lewis-Geer Mfg. Co., Ypsilanti, for production of aircraft equipment, including gliders.

Detroit Tap & Tool Co., Inc., 635 Mount Elliott Avenue, Detroit, manufacturer of taps, drills and other tools, formerly known as Dumore Tap & Tool Co., has arranged for increase in capital from $15,000 to 250,000 shares of stock, no par value, part of proceeds to be used for expansion.

Cleveland

CLEVELAND, Aug. 25.—Machine tool buyers when approached by salesmen are showing more interest in new equipment than they have for the past two or three months and sentiment shows some improvement. However, there was no improvement the past week in orders or inquiries. Sales are still confined to single machines and orders are light. While there is no noticeable change in demand for standard machines, signs of a revival in the call for presses are noted. One order for nine small presses was placed during the week by an Ohio manufacturer of kitchenware, and two inquiries for good-sized lots of presses have come from stamping plants engaged in automotive work.

Anson Aero Mfg. Co., Youngstown, manufacturer of airplanes and parts, has plans for new one-story factory to cost over $70,000 with equipment.

Board of Education, Cleveland, F. G. Hogan, director, is considering installation of manual training equipment in one or more of three new high schools to be erected on West 140th Street, West Fifty-second Street and Biddulph Avenue, and Canton and Worley Avenues, respectively, each three stories, first noted to cost about $1,000,000 and other two, each close to $800,000. Bids will be asked on general contract in fall. George W. Hopkinson, Auditorium Garage Building, is architect for board.

Toledo Saw & Grinding Co., Toledo, recently organized by Richard A. McClure, 1303 Ohio Bank Building, Toledo, and associates with $25,000 capital, plans operation of local factory for manufacture of mechanical specialties. Roger Gihan, Toledo, is interested in new company.

E. Mason Wick, Youngstown, has purchased Sterling Mfg. Co., Salem, Ohio, manufacturer of silos and farm implements, and plans to enlarge business.

Chicago

CHICAGO, Aug. 25. — Miscellaneous orders for machine tools are in sufficient volume to raise the hopes of some dealers that August sales will hold even with July, which was the low point of the year. Lists that are out from the Chicago school board could be counted on to help the situation were it not for the fact this class of business usually moves slowly and only a few days remain in the month. The Majestic Household Utilities Corporation, Chicago, has placed substantial orders the past week and several purchases have been made by agricultural implement manufacturers.

Extreme dullness is shown by local tool and die shops. A year ago existing shops were more than amply supplied with work. This attracted newcomers into the field with the result that Chicago appears to be over populated with shops of this kind and such work as is available is now spread to many hands.

Prices for machine tools are steady. One line of lathes is being advanced 10 per cent.

Nehring Electrical Works, De Kalb, Ill., will start work soon on a new factory to house copper wire drawing equipment and cable manufacturing machinery.

A. Finkl & Sons Co., 1326 Cortland Street, Chicago, manufacturer of forgings, has purchased former plant of T. A. Cummings Foundry Co., adjoining, for expansion.

Mount Vernon Furnace & Mfg. Co., Mount Vernon, Ill., has purchased plant of Universal Stove Corporation, Inc., St. Louis, and will remove business to Mount Vernon.

Standard Oil Co. of Indiana, Inc., 910 South Michigan Avenue, Chicago, is planning construction of a new refinery at Casper, Wyo., where property has been acquired, initial units to cost over $1,000,000 with machinery.

Winona Machine & Foundry Co., 62 Washington Street, Winona, Minn., is planning to rebuild part of plant recently damaged by fire. Works of Winona Boiler Co., on adjoining site, were also destroyed and rebuilding is being considered.

Farmers Union Terminal Association, Minnesota Building, St. Paul, Minn., will soon begin construction of an addition to grain elevator, with installation of elevating, conveying, screening and other equipment, to cost about $200,000.

Great Northern Railway Co., Railroad Building, St. Paul, Minn., is considering addition to boiler shop at repair works at Glendive, Mont., one story, 45 x 100 ft., to cost about $45,000 with equipment. A new engine house is contemplated at same shops to cost close to like amount. Work is under way on a one-story addition to machine shop. T. D. McMahon, address noted, is company architect.

Board of Education, Burlington, Iowa, plans installation of manual training equipment in new junior high school to cost about $200,000, for which bids are being asked on general contract. W. F. Weibley, Burlington, is architect.

Cleveland-Cliffs Mining Co., Coleraine, Minn., has awarded building contract to Worden-Allen Co., Builders' Exchange, Duluth, Minn., for a one-story iron ore washing plant at local properties, 100 x 200 ft., to cost about $200,000 with machinery.

Liebenberg Kaplan, McKnight Building, Minneapolis, architect, has filed plans for two-story automobile service, repair and garage building, 155 x 158 ft., to cost about $150,000 with equipment.

Shanklin Metal Products Co., incorporated with $15,000 capital stock, has begun production of brass and steel stampings and screw machine products at 116-121 North Eleventh Street, Springfield, Ill., adjoining plant of parent company, Shanklin Mfg. Co.

Indiana

INDIANAPOLIS, Aug. 25.—George R. Carter Co., Connersville, manufacturer of automobile trimmings, wire specialties, etc., has leased former plant of Copeland Products, Inc., Lycaste Avenue, Detroit, for new works, and will remove to new location. Property consists of two-story unit on 1½-acres, totaling about 35,000 sq. ft. floor space, which Carter company proposes to increase to over 75,000 sq. ft. Company is a subsidiary of Voght Mfg. Co., Rochester, N. Y.

Guide Lamp Corporation, Anderson, is arranging for early increase in capacity, with removal of branch plant at Cleveland to local works, where production will be concentrated. Work has been completed on a new one-story unit, 250 x 560 ft., for expansion.

H. N. Robinson & Co., Inc., Michigan Street and Crown Avenue, Evansville, iron and steel products, has plans for a one-story addition, 52 x 78 ft., to cost about $20,000 with equipment.

Central Indiana Gas Co., Muncie, is planning expansion and improvements to cost about $1,000,000, larger part of appropriation to be used for extensions in artificial gas generating plant, additional machinery for production and distributing equipment.

Shell Petroleum Corporation, Shell Building, St. Louis, is considering a new oil storage and service building, with one-story machine shop, at Lafayette, Ind., to cost about $50,000 with equipment.

Milwaukee

MILWAUKEE, Aug. 25.—For the first time in fully two months, an optimistic tone is noted in the machine tool trade. This is predicated largely on new prospects and inquiry from some leading customers of local shops who have not been in the market in some time. August sales are generally reported to be slightly larger than in July, which was the low point. Business in used tools is slow, but stocks are not heavy.

Wisconsin Axle Co., Oshkosh, Wis., specializing in double reduction axles for trucks, buses, etc., has placed contracts for a shop addition, second within eight months, to cost, with equipment, about $50,000.

Filer & Stowell Co., 219 Becher Street, Milwaukee, general founder and machinist and manufacturer of sawmill machinery, logging equipment, etc., has broken ground for a three-story addition, 70 x 85 ft., for production and office purposes.

Manitowoc Shipbuilding Corporation, Manitowoc, Wis., has received contract from Construction Materials Co., Chicago, for three steel barges, 135 ft. long, with 42-ft. beam. One will be fabricated by electric welding process.

Nordberg Mfg. Co., Oklahoma and Chase Avenues, Milwaukee, has placed general contract with Bentley Brothers, Inc., 808 South Pierce Street, for a one-story addition, 87 x 87 ft., designed by Frank D. Chase, Inc., Chicago.

Milwaukee Department of Public Works, City Hall, is taking bids until Sept. 9 on three 2500-gal. per min. motor-driven centrifugal pumps for new high pressure fire service station on Kinnickinnic River. Bond for $6,000 or certified check for $3,000 required with each bid. David McKeith is commissioner of public works.

Plant of Eau Claire Sand & Gravel Co., Eau Claire, Wis., burned Aug. 16 with practically total loss of $100,000, will be rebuilt with replacement of machinery, crushers, conveyors, etc.

Bayley Blower Co., 732 Greenbush Street, Milwaukee, manufacturer of air conditioning machinery, blowers, fans, etc., is adding to production force to handle orders totaling in value upward of $150,000.

M. Tullgren & Sons Co., architect, 20 Prospect Avenue, Milwaukee, closes bids Aug. 28 for construction of new Milwaukee branch factory and warehouse of Crane Co., Chicago. Main building will be 74 x 200 ft., two stories and basement, with auxiliary buildings, including machine shop, pipe shop, garage, etc. E. M. Faul is branch manager.

Cincinnati

CINCINNATI, Aug. 25.—While a slight increase in demand for lathes and cutter grinders was noted the past week, the machine tool market in this district is still sluggish. Requests for quotations, while not overabundant, have a more encouraging tone and it is felt that these will result in more business than has been the case in several months. Production is still below normal and many shops are running five days a week, others are alternating forces each week, while some plants have closed their night shifts and curtailed day production. On the whole, demand during August reached the lowest level of the year.

Globe Tool & Engineering Co., 124 Gilbert Avenue, Dayton, Ohio, has taken out a permit for one-story shop, 30 x 90 ft.

Contracting Officer, Wright Field, Dayton, will receive bids until Sept. 2 for couplings, flanges, unions, pipe bushings, and other aircraft supplies.

Grimm Iron Works, 2431 Spring Grove Avenue, Cincinnati, has asked bids on general contract for new one-story plant, 80 x 172 ft., to cost over $45,000 with equipment.

Dehli Foundry Sand Co., Cincinnati, care of P. L. Strange & Co., Chamber of Commerce Building, recently formed by H. F. McVay and associates, with capital of $50,000, contemplates operation of plant for production and distribution of foundry sand and other foundry supplies. J. R. Ginn, Cincinnati, is interested in new organization.

Manncraft Airplane Corporation, Collierville, Tenn., manufacturer of aircraft and parts, is considering erection of one-story plant, 60 x 120 ft., to cost about $35,000 with equipment. H. W. Mann, Jr., is general manager.

Board of Trustees, West Kentucky Industrial College, Paducah, Ky., has plans for an addition to cost about $80,000. G. Tandy Smith, Guthrie Building, is architect.

Pan-American Petroleum Corporation, Nashville, Tenn., has awarded general contract to Boone Contracting Co., Nashville, for one-story oil storage and dis-

tributing plant, to cost about $65,000 with equipment.

Southern Boiler & Tank Works, Inc., 1281 Thomas Street, Memphis, Tenn., has plans by Anker F. Hansen, Shrine Building, architect, for rebuilding plant recently destroyed by fire, with loss of about $70,000 including equipment.

St. Louis

ST. LOUIS, Aug. 25.—Contract has been let by Pevely Dairy Co., Grand Street and Chouteau Avenue, St. Louis, to Fruin-Colnon Contracting Co., Merchants Laclede Building, for one-story automobile service, repair and garage building, 134 x 300 ft., for company motor trucks and cars, to cost over $100,000 with equipment. Leonard Haeger, 3844 Utah Place, is architect and engineer.

Board of Education, Belleville, Kan., is planning installation of manual training equipment in new two-story and basement high school to cost about $125,000, for which bids have been asked on general contract. S. S. Voigt, 522 South Lawrence Avenue, Wichita, Kan., is architect.

Werme Steel & Iron Co., North Indiana Street, Oklahoma City, Okla., has plans for a one-story addition, 100 x 300 ft., to cost over $70,000 with equipment, and will begin superstructure at once.

Southern Ice & Utilities Co., Second and Byrd Streets, Little Rock, Ark., has purchased property at Malvern, Ark., for erection of one-story ice-manufacturing plant, to cost about $45,000 with machinery.

Herman Body Co., 4400 Clayton Road, St. Louis, manufacturer of commercial automobile bodies, is considering a one-story addition, to cost over $30,000 with equipment. Herman E. Plew is president.

Howard N. Hansen Co., Midco Building, Tulsa, Okla., is contemplating early establishment of plant for production of a line of patented mechanical specialties for oilfields.

Mo-Ark Oxygen Co., Fort Smith, Ark., manufacturer of industrial oxygen, etc., is considering a plant expansion, including installation of equipment for production of nitrogen. Company has installed considerable machinery for oxygen manufacture.

Ovens, power equipment, conveying and other machinery will be installed in new one-story and basement addition 150 x 160 ft., to plant of Papendick Bakery Co., 3500 North Florissant Street, St. Louis, for which general contract has been let to Acme Construction Co., Railway Exchange Building, to cost over $100,000. W. E. Long Co., 155 North Ozark Street, Chicago, is architect.

Gulf States

BIRMINGHAM, Aug. 25.—Gulf States Steel Co., Brown-Marx Building, Birmingham, has asked bids on general contract for new one-story addition for mechanical service at Sayre mining properties, 77 x 117 ft., to cost over $85,000 with equipment.

Shell Petroleum Corporation, Shell Building, St. Louis, has begun construction of a new gasoline refinery near Hobbs, N. M., to cost over $500,000 with machinery.

New Orleans Public Service Co., Baronne and Union Streets, New Orleans, operating local traction system, has asked bids on general contract for new one and one-half story repair shop and rolling stock building, 35 x 150 ft., to cost over $40,000 with equipment. Company engineering department is in charge.

City Council, Natchitoches, La., has plans for a hangar with repair facilities at municipal airport, to cost about $21,000 with equipment.

Board of Education, San Antonio, Tex., is planning installation of vocational training equipment in new two and three-story senior high school in Spanish Acres district to cost $1,000,000, for which bids are being asked on general contract until Sept. 10. Adams & Adams, Real Estate Building, are architects; W. E. Simpson Co., Milam Building, are engineers.

War Department, Washington, has awarded a general contract to Kenneth L. Colborn, Inc., Pasadena, Cal., for 18 hangars, averaging 110 x 220 ft., at Randolph Field, Schertz, Tex., to cost $556,820, with repair and reconditioning facilities.

J. B. Beaird Corporation, 6300 St. Vincent Avenue, Shreveport, La., manufacturer of mechanical equipment, has plans for a one-story addition to machine shop to cost about $23,000 with equipment.

South Texas Cotton Oil Co., Ashland and Twenty-fifth Streets, Houston, Tex., has acquired plants and real estate of Travis Cotton Seed Products Co., including cottonseed oil mills at Corpus Christi, San Antonio, Hearne and Taylor, Tex., for price of $530,000. New owner will continue mills and plans expansion in different units. Company will also develop acquired holdings of Travis company in Bexar, Robertson, Nueces and Williamson Counties.

Pacific Coast

SAN FRANCISCO, Aug. 21.—Board of Trustees, University of California, San Francisco, has plans for new power plant to cost about $45,000 with equipment. William C. Hays, Crocker First National Bank Building, is architect.

W. R. Little, 1614 South Flower Street, Los Angeles, and associates, have organized Kingman Refining & Smelting Corporation, with headquarters at Kingman, Ariz., capitalized at $1,000,000, and are planning construction of new custom smelting plant near Kingman, to cost over $400,000 with equipment. Elmer A. Hester and William F. Engler are interested in new company.

California-Oregon Power Co., Medford, Ore., has applied for permission to construct and operate a hydroelectric generating plant on North Umpqua and Clearwater Rivers, Douglas County, Ore., to cost over $10,000,000 including steel tower transmission lines, switching stations and other operating structures. Company is also considering another hydroelectric power project on Klamath River near California State line, to cost over $15,000,000.

Camas Machine Co., Camas, Wash., Charles Gfeller, manager, operating a general machine works, has plans for a new one-story shop, 50 x 75 ft., to cost about $20,000 with equipment.

Board of Education, Jordan High School District, Sandy, Utah, is planning installation of manual training equipment in new three-story and basement high school at Bingham, to cost about $300,000, for which bids on general contract have been asked. Scott & Welch, Dooly Building, Salt Lake City, Utah, are architects.

Wilson Valve Co., Renton, Wash., care of Paul W. Houser, Hoge Building, Seattle, representative, recently organized by C. W. Wilson and associates with capital of $100,000, plans operation of local factory for manufacture of valves and other steam and plumbing specialties. L. L. Lawson, Seattle, is also interested in company.

Canada

TORONTO, Aug. 25.—Miller Brothers & Sons, 120 Dalhousie Street, Montreal, manufacturers of cranes, derricks, etc., have plans for a 3-story plant, 100 x 140 ft. J. M. Miller, 648 Dorchester Street West, is architect.

Galt Malleable Iron Co., Galt, Ont., has let contract to G. H. Thomas & Son, Ltd., 45 Dickson Street, for rebuilding plant, recently destroyed by fire, to cost about $20,000.

Dominion Paint Works, Ottawa Street, Walkerville, Ont., has awarded contract to W. H. Yates Construction Co., Ltd., 17 Main Street East, Hamilton, Ont., for a five-story addition, 47 x 54 ft., to cost $85,000. Hutton & Souter, 6 James Street South, Hamilton, are architects.

Union Terminals, Ltd., Grain Exchange Building, Winnipeg, has awarded general contract to Carter-Halls-Aldinger Co., Ltd., Royal Bank Building, Winnipeg, for a $400,000 grain elevator at Port Arthur, Ont. C. D. Howe & Co., Whalen Building, Port Arthur, are engineers.

Foreign

A FUND of $5,500,000 has been authorized by French Chamber of Deputies, Paris, France, for development of Government airport at Le Bourget, including construction of hangars, repair shops, oil storage and other structures, aeronautical laboratories and experimental buildings.

Compania Radio Internacional do Brazil, Rio de Janeiro, Brazil, affiliated with International Telephone & Telegraph Co., 67 Broad Street, New York, has secured a concession from Government of Brazil for 10 years for construction and operation of international radio broadcasting and receiving stations and plans early installation of plants for connections with United States, European and South American countries, including power stations, towers, etc.

Ovens, power equipment, conveying and other machinery will be installed in new three-story and basement plant to be constructed by Love's Biscuit & Bread Co., Honolulu, T. H., to cost about $300,000 with machinery.

Amalgamated Metal Corporation, London, England, has authorized increase in capital from £5,000,000 to £5,600,000 (about $2,916,000), for expansion and acquisition of interest in metal companies in Germany and Belgium.

Government of Greece, Athens, has awarded a contract to Ulen & Co., 120 Broadway, New York, for installation of a rapid filter system for new municipal water supply, to develop daily capacity of 15,000,000 gal., to cost $400,000. American equipment will be used.

Societe Generale des Produits Tartriques, 69 Boulevard Haussmann, Paris, France, operating a plant at Saint-Laurent-d'Aigouzes for production of tartaric acid under a special process, has arranged for a new stock issue of 20,000 shares at par value of 500 fr. each (about $400,000), part of fund to be used for expansion, including developments with use of process in other countries.